NASA Procedural Requirements

NPR 8820.2F
Effective Date: January 28, 2008
Expiration Date: January 28, 2013

COMPLIANCE IS MANDATORY

Facility Project Requirements

Responsible Office: Facilities Engineering and Real Property Division

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Preface

P.1 Purpose

The purpose of this NASA Procedural Requirements (NPR) is to provide the minimum requirements for the planning and acquisition of NASA facility projects.

P.2 Applicability

This NPR applies to NASA Headquarters, Centers, Component Facilities, and Jet Propulsion Laboratory (JPL) only to the extent specified or referenced in their contract. NASA's program and project policy is found in the NPR 7120 series. The Facility Project Manager (FPM) must comply with these policies; however, the project requirements within this NPR apply to all facility projects on NASA-owned or -controlled real property.

A requirement in this NPR is identified by "shall," a good practice by "should," permission by "may" or "can," expected outcome or action by "will," and descriptive material by "is" or "are" (or other verb form of "to be").

P.3 Authority

a. 42 United States Code (U.S.C.). 2473 (c)(1), Section 203 (c)(1) of the National Aeronautics and Space Act of 1958, as amended (http://www.nasa.gov/offices/ogc/about/space_act1.html).

b. NASA Policy Directive (NPD) 8820.2, Design and Construction of Facilities (http://nodis3.gsfc.nasa.gov/displayDir.cfm?t=NPD&c=8820&s=2C).

P.4 Applicable Documents

The following references apply to facilities projects:

a. Executive Order (EO) 12114, Environmental Effects Abroad of Major Federal Actions.

b. EO 12196, Occupational Safety and Health Programs for Federal Employees, as amended.

c. EO 12372, Intergovernmental Review of Federal Programs, 3 CFR (1982 Compilation), as amended by Executive Order 12416, 3 CFR (1983 Compilation).

d. EO 12699, Seismic Safety of Federal and Federally Assisted or Regulated New Building Construction.

e. EO 12941, Seismic Safety of Existing Federally Owned or Leased Buildings.

f. EO 13327, Federal Real Property Asset Management.

g. EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management.

h. Code of Federal Regulations (CFR) Part 434, Title 10, Energy Code for New Federal Commercial and Multi-Family High Rise Residential Buildings.

i. 10 CFR Part 436, Federal Energy Management and Planning Programs.

j. 14 CFR Part 1216, Environmental Quality.

k. 29 CFR Part 1910, Occupational Safety and Health Standards.

l. 29 CFR Part 1926, Safety and Health Regulations for Construction.

m. 29 CFR Part 1960, Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters.

n. 36 CFR 800, Protection of Historic Properties, of the National Historic Preservation Act (NHPA).

o. NPD 1000.0, Strategic Management & Governance Handbook.

p. NPR 1441.1, NASA Records Retention Schedules.

q. NPR 1600.1, NASA Security Program Procedural Requirements.

r. NPR 1620.2, Physical Security Vulnerability Risk Assessments.

s. NPR 1620.3, Physical Security Requirements for NASA Facilities and Property.

t. NPR 1800.1, NASA Occupational Health Program Procedures.

u. NPD 1800.2, NASA Occupational Health Program.

v. NPD 1820.1, NASA Environmental Health Program.

w. NPR 4200.1, NASA Equipment Management Procedural Requirements.

x. NPR 7120.5, NASA Space Flight Program and Project Management Requirements.

y. NPR 7120.7, Institutional Infrastructure and Information Technology Program and Project Management Requirements.

z. NPR 7120.8, NASA Research and Technology Program and Project Management Requirements.

aa. NPD 7330.1, Approval Authorities for Facility Projects.

bb. NPR 8000.4, Risk Management Procedural Requirements.

cc. NPD 8010.2, Use of the SI (Metric) System of Measurement in NASA Programs.

dd. NPD 8500.1, NASA Environmental Management.

ee. NPR 8530.1, Affirmative Procurement Program and Plan for Environmentally Preferable Products.

ff. NPR 8553.1, NASA Environmental Management System (EMS).

gg. NPR 8570.1, Energy Efficiency and Water Conservation.

hh. NPR 8580.1, Implementing The National Environmental Policy Act and Executive Order 12114.

ii. NPD 8700.1, NASA Policy for Safety and Mission Success.

jj. NPD 8710.5, NASA Safety Policy for Pressure Vessels and Pressurized Systems.

kk. NPR 8715.3, NASA General Safety Program Requirements.

ll. NPD 8800.14, Policy for Real Property Management.

mm. NPR 8800.15, Real Estate Management Program Implementation Manual.

nn. NPD 8810.2, Master Planning for Real Property.

oo. NPR 8810.1, Master Planning Procedural Requirements.

pp. NPD 8820.2, Design and Construction of Facilities.

qq. NPR 8831.2, Facilities Maintenance Management.

rr. NPD 9050.6, NASA Exchange and Morale Support Activities.

ss. NASA Partnering Desk Reference.

tt. NASA Reliability Centered Building and Equipment Acceptance Guide.

uu. NASA Project Definition Rating Index (PDRI) Manual.

vv. Office of Management and Budget (OMB) Circular A-11, Preparation, Submission and Execution of the Budget.

ww. OMB A-94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs.

xx. OMB Circular A-131, Value Engineering.

yy. Federal Acquisition Regulation (FAR).

zz. NASA FAR Supplement (NFS).

aaa. NASA-STD 1740.12, Safety Standard for Explosives, Propellants, and Pyrotechnics.

bbb. NASA-STD 8719.7, Facility System Safety Guidebook.

ccc. NASA-STD 8719.9, Standard for Lifting Devices and Equipment.

ddd. NASA-STD 8719.10, Safety Standard for Underwater Facility and Non-Open Water Operations.

eee. NASA-STD 8719.11, Safety Standard for Fire Protection.

fff. NASA-STD 8719.17, NASA Requirements for Ground-Based Pressure Vessels and Pressurized Systems.

ggg. Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding, dated January 2006.

P.5 Measurement/Verification

P.5.1. Do Centers' Construction of Facilities (CoF) programs comply with the requirements of this NPR? To verify compliance, Facility Program Engineers assigned to Headquarters Facilities Engineering and Real Property Division will perform annual CoF program reviews at the Centers.

Reviews entail taking a random selection of CoF projects from each Center and, for those projects, reviewing documentation and interviewing project managers and project stakeholders.

P.6 Cancellation

This revision cancels NPR 8820.2E, dated October 7, 2003.

/S/
Thomas Luedtke
Associate Administrator for Institutions and Management

Chapter 1. NASA's Facilities Program

1.1 Facility Program Content

The annual facility program is part of the Agency's five-year budget described in NPD 1000.0, Strategic Management & Governance Handbook (see http://nodis3.gsfc.nasa.gov). The five-year budget includes the Construction of Facilities (CoF) program under the Institutional Investment account. The CoF program comprises funds for four project types:

1.1.1 **Discrete Projects** -- Discrete Projects are projects with an estimated construction cost of $5 million or more.

1.1.2 **Minor Revitalization and Construction Projects (MRCs)** -- MRCs are projects with an estimated construction cost of at least $500,000 and up to $5 million.

1.1.3 **Demolition Projects** -- Demolition Projects are projects eliminating real property assets no longer required by NASA.

1.1.4 **Facility Planning and Design (FP&D)** -- FP&D are funds used to plan and design facility projects.

1.2 Facility Program Best Practices

Centers shall comply with NASA-accepted best practices regardless of fund source (e.g., NASA Program, Institutional Investment Account, or third-party funded). The accepted best practices include the following:

a. Front-end planning to define project requirements using comprehensive planning tools such as the PDRI, team building, and other techniques.

b. Site investigation and sufficient preliminary design to fully develop project scope, assess risks, identify construction complexities, and provide a realistic cost estimate prior to inclusion into the NASA budget submission to OMB.

c. Use of life-cycle cost vs. first cost to select project systems, equipment, materials, and methods.

d. Designing for maintainability to optimize operation and maintenance costs and effort.

e. Commissioning installed equipment, systems, building envelope, and other building elements to ensure quality, reliability, and systems integration.

f. Using environmentally friendly processes, materials, and equipment. When a project includes demolition, maximize reuse vs. disposal.

g. Applying constructability concepts and principles during each phase of the facility project process to ensure the project execution remains practical.

h. Using partnering tools and techniques to establish and maintain professional working relationships among project stakeholders (including, but not limited to, users, contractors, and construction managers).

i. Practicing effective configuration and change order control to minimize project cost and schedule growth.

j. Using United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) concepts.

k. "Making Zero Incidents a Reality" -- a safety initiative encouraging proactive safe behavior during the construction phase.

1.3 CoF Program Formulation

NASA Centers and Headquarters formulate the CoF program through a collaborative process. The following paragraphs and Figure 1-2, CoF Program Management, describe this process.

1.3.1 **Guidance** -- Each year, NASA's Office of the Chief Financial Officer (OCFO) issues guidance to the Centers for reporting their budget requests. The OCFO coordinates this through the Mission Directorates and Mission Support Offices.

1.3.2 **Establishing Project Scope** -- Each project must have clearly defined goals and objectives (see Appendix A, Definitions, "full disclosure concept"). Federal appropriations require "Full Funding" (see OMB Circular A-11, Section 31.6). "Full Funding" means the project budget includes sufficient funds to complete a useful segment of a capital project (investment) before any funds are obligated for that segment. Budget requests for acquisition of capital assets must propose "Full Funding."

1.3.3 **Fragmentation** -- NASA Centers have no authority to fragment facility projects or circumvent the CoF approval process. In establishing a project scope, a NASA Center must include all of the necessary elements in a single project to avoid fragmentation or the appearance of fragmentation. (See Appendix A, Definitions, "fragmentation," "facility project," and "full disclosure concept" definitions). For multiple projects within one facility, there shall be at least 90 days separation between beneficial occupancy of one project and the award of any subsequent project.

1.3.4 **Incremental Programming for Facility Requirements** -- Incremental programming for facility requirements is a process to plan and execute CoF funding over more than one fiscal year for a specific purpose. Incremental programming differs from fragmentation in that it fully discloses the overall plan. The Director, FERPD must approve incremental programming for facility requirements before inclusion into any Center's five-year plan. Incremental funding requests shall include a reasonable explanation for the action, an overall

schedule including major milestones, total estimated costs, planned scope, and objectives.

1.3.4.1 The Center CoF program manager shall provide incremental planning project documents to FERPD for review. These planning documents must include the following:

a. The total estimated cost of the completed incremental project (all phases).

b. The estimated cost of this project phase for the planned budget year.

c. The costs of previously approved or budgeted project phase(s).

d. The planned costs of each future project phase by fiscal year.

e. Whether or not this particular project phase will yield a usable facility or portion thereof.

1.3.5 **Budget Request (Five-Year Plan)** -- Centers shall develop and submit a Budget Request (Five-Year Plan) in accordance with the annual guidance issued through the NASA OCFO (see paragraph 1.3.1 and Figure 1-1). Prior to this guidance, FERPD issues a data call with guidance and reporting requirements to the Centers. FERPD, Centers, and other Headquarters offices prioritize the CoF program Agency wide using the Centers' submitted data.

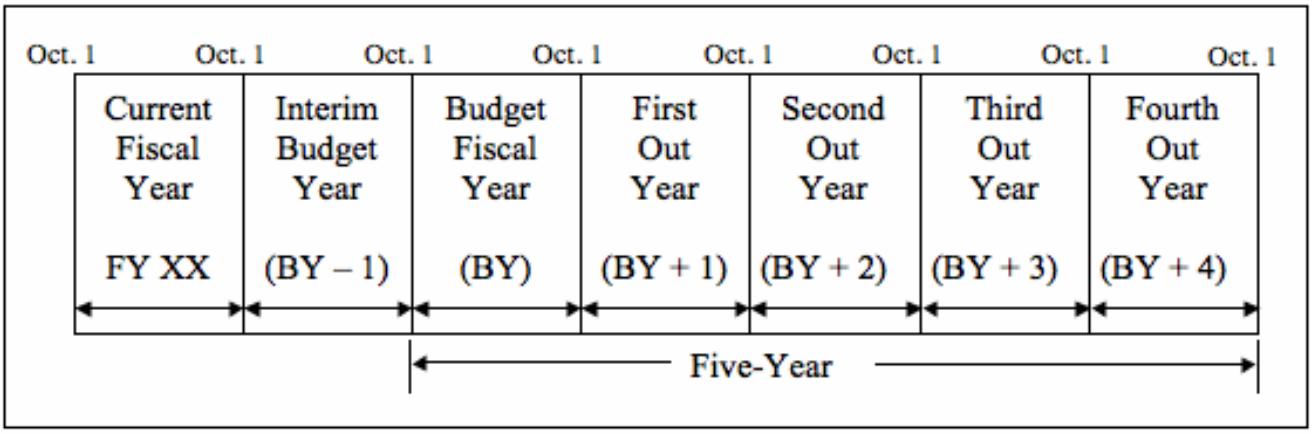


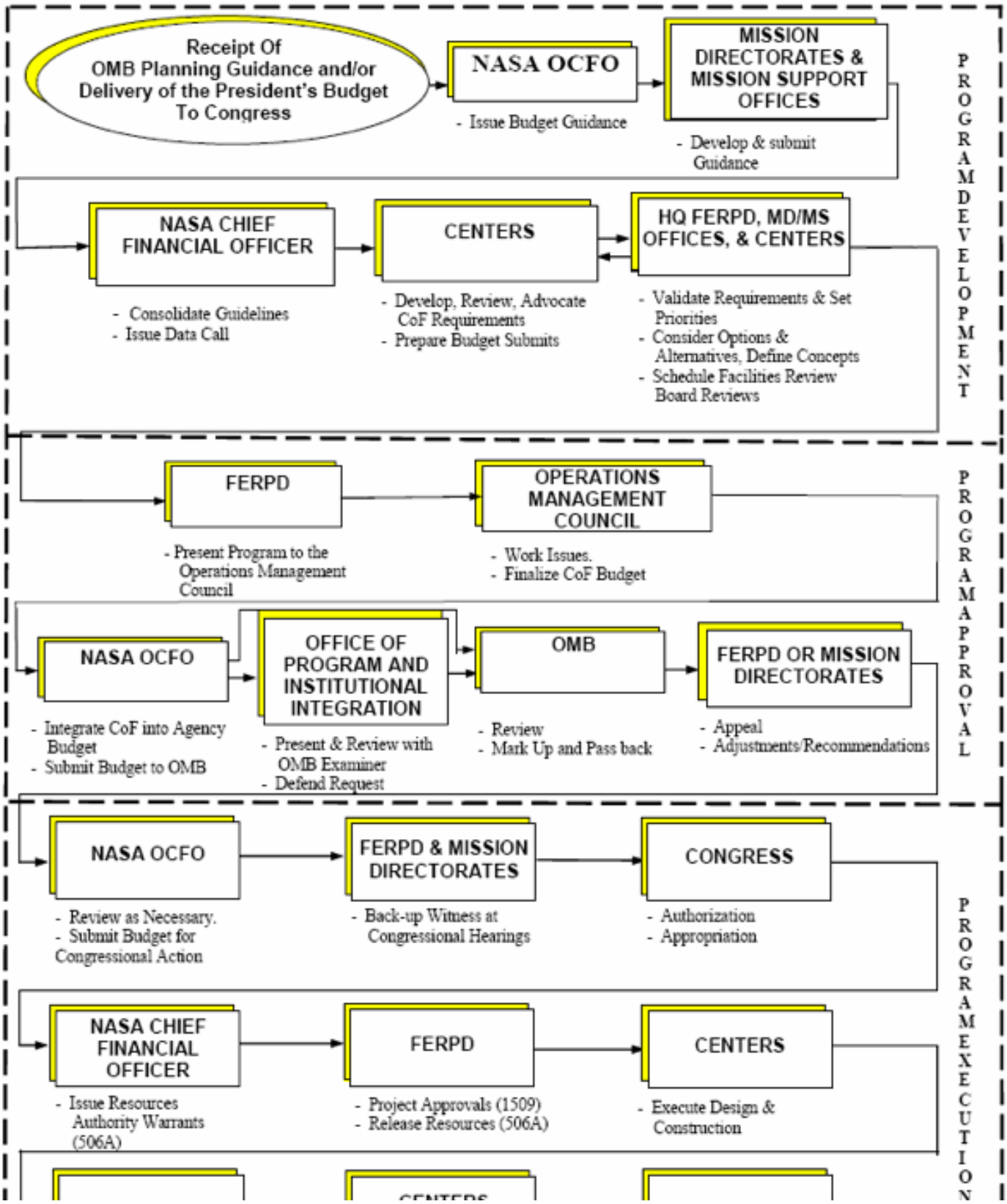
Figure 1-1 CoF Five-Year Plan

1.3.6 **Documentation** -- NASA Form 1509, Facility Project-Brief Project Document, and NASA Form 1510, Facility Project Cost Estimate are required for all CoF projects requested for inclusion in the Budget Year (BY). Discrete CoF projects also must have a Life-Cycle Cost Analysis (LCCA) and a draft budget narrative (seehttp://www.hq.nasa.gov/office/codej/co http://www.hq.nasa.gov/office/codej/codejx/Assets/Docs/Case_Guide_4-20-06.pdf).

1.3.7 **Headquarters Review and Prioritization** -- The Headquarters Office of Infrastructure and Administration, FERPD shall lead the review and prioritization of institutional facility projects submitted in the Headquarters five-year Plan based upon the Centers' response to the annual guidance. This review will include an evaluation of existing capabilities to minimize or eliminate the creation of excess capacity within NASA or the private sector (e.g., construction of a ground-based test facility at a particular Center when there is adequate availability and capability to accomplish the same requirements at a different Center or in the private sector). For facilities projects funded from other sources (e.g., program direct, third party), FERPD and the associated Mission Directorate coordinate the process.

1.3.8 **Public Release** -- Until released by the appropriate committees of Congress, there shall be no public disclosure of CoF project information (including subprojects and/or work packages).

1.3.9 **CoF Program Approvals** -- Figure 1-2 depicts the CoF program approval process. The CoF program is part of the annual appropriations submitted to OMB by NASA.



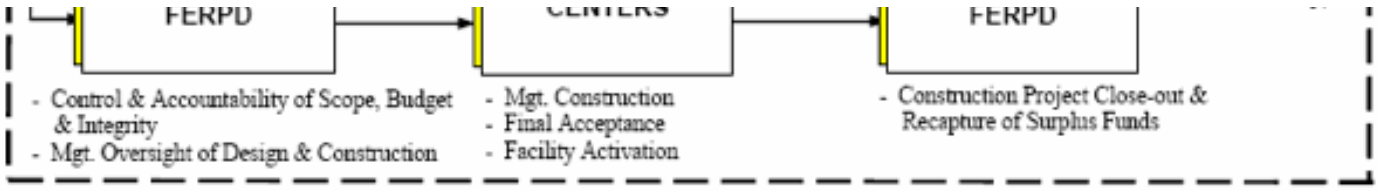


Figure 1-2 CoF Program Management

1.3.10 **NASA Headquarters** -- Based upon the five-year plans submitted by the Centers, NASA Headquarters prepares and submits the draft appropriation request to OMB. This requires coordination with the OCFO, Mission Directorates, Mission Support Offices, and Center Management. The NASA Administrator, through the OCFO, is responsible for NASA's appropriation request.

1.3.11 **OMB Review** -- OMB reviews NASA's five-year Plan and responds with changes, comments, and questions via a "passback." After NASA answers the passback, OMB provides a "markup" for use in preparing NASA's final submission. Using the OMB budget markup, NASA prepares and submits a final budget appropriation request to OMB. Following final approval, OMB incorporates NASA's planned budget into the President's budget for submission to Congress.

1.3.12 **Facility Project Authorization and Appropriations** -- Using the President's budget as a starting point, committees in the Senate and House of Representatives develop the authorization and/or appropriation bills. The Congress approves and sends the bill(s) to the President for review and action. The bill becomes public law (or act) once the President has approved it.

1.3.13 **Program Oversight** -- As the CoF program proceeds through the authorization and appropriation process, NASA Headquarters (OCFO, FERPD, Mission Directorates, and Mission Support Offices) will inform the Centers concerning the status of proposed facility projects.

1.3.14 **Program Execution** -- Execution is the process of obligating and managing contracts to accomplish project objectives. To "obligate" funds on a project means to award a contract or purchase order. NASA HQ FERPD has set goals of obligating 90 percent of CoF projects and 80_percent of their associated budget of that fiscal year. (See NPD 8820.2, Design and Construction of Facilities at http://nodis3.gsfc.nasa.gov and Self-Assessment Metrics in Appendix C). Early obligation of CoF projects is encouraged, and late obligation could place a project at risk to lose project funding. (See Appendix A, Definitions, "at-risk project"). The following paragraphs describe facility program execution, and Figure 1-2 depicts this process.

1.3.15 **Financial Resources for Facility Projects** -- The annual appropriations acts contain the principal funding authorities for CoF projects. This funding supports preliminary engineering, design, and construction of those projects. Identifying, planning, and developing the requirement into a proposed project and its activation after construction are paid for using non-CoF funds (see Figure 1-3, Facilities Project Activities and Funding). The FPM may use non-CoF funds, as authorized and appropriated within annual appropriations and authorization acts, for engineering, planning, design, construction, and activation of CoF projects. In some instances, another Federal agency, State or local government, or other party

will finance facility work at a Center through Agency agreements, the private sector as specified in contracts, or a nonappropriated fund activity such as a NASA Exchange. Regardless of the source of funds, approval authority must comply withNPD 7330.1, Approval Authorities for Facility Projects.

1.3.16 **Facility Project Fiscal Management**

1.3.16.1 **CoF Thresholds** -- See paragraph 1.1 for current CoF fund types and associated thresholds. The annual appropriation legislation is the only accepted source for adjustments to CoF thresholds.

1.3.16.2 **Project Approval and Documentation** -- The authorities and responsibilities identified in NPD 7330.1, Approval Authorities for Facility Projects, apply to all facilities projects, regardless of fund source. Each facility project estimated to cost $100,000 or more must have an approved NASA Form 1509, Facility Project-Brief Project Document, and NASA Form 1510, Facility Project Cost Estimate, prior to obligating funds on that project. The facility project manager shall prepare these documents in accordance with the instructions in Appendix C, Forms and Instructions. Approval requirements vary according to the types of funds expended as follows:

a. **Center-Approved and -Funded Projects** -- Center-Approved and -Funded Projects are projects with an estimated cost of less than $500,000. Centers approve and fund these projects; however, FERPD reviews NASA Forms 1509 and 1510 for projects estimated to cost $100,000 or more for compliance with the NASA policy.

b. **Facility Planning and Design Funds (FP&D)** -- Based on the results of the prioritization process, FERPD authorizes projects for design and provides funds to accomplish planning and design of CoF projects. Center CoF Managers request funds and approval via the CoF Routine Transaction Form, and FERPD replies with authority to design using the same form.

c. **MRC Projects and Discrete Projects** -- Centers request project approval by sending the signed version of the NASA Forms 1509 and 1510 to FERPD using the CoF Routine Transaction Form. FERPD reviews and approves the project and the expenditure of discrete or minor funds by signing and obtaining signatures on the NASA Form 1509. FERPD transmits copies of the signed forms, notification of funding, and approval authority using the CoF Routine Transaction Form. For MRC projects, FERPD communicates provisions for increasing expenditures on the Minor Facility Projects Summary Brief Project Document,Form Form 800/02at the time of issue.

d. **Third-Party Funded Facilities Projects** -- Funding approval and authority must comply with the party providing funds; however, NASA approval requirements still must comply with NPD 7330.1, Approval Authority for Facilities Projects (see http://nodis3.gsfc.nasa.gov http://nodis3.gsfc.nasa.gov). Centers request approval by sending NASA Form 1509 and 1510 1510 to the Director, FERPD for review and approval.

1.3.16.3 **Requesting Funds** -- Center CoF Managers shall use the CoF Routine Transaction Form with NASA Forms 1509 and 1510 attached for each project to request funds.

1.3.16.4 **Receipt of Funds** -- After project approval is complete, FERPD transmits funding to the Centers electronically through NASA's financial system. Centers shall award CoF contracts only upon receiving approval authority and funds.

1.3.16.5 **Procurement** -- When professional services, such as a design by an Architect Engineer (A-E) firm or a construction contractor for construction, are required, the contract acquisition shall comply with the FAR and NASA FAR supplement.

1.3.16.6 **Project Design** -- Center Project Managers must design facility projects in accordance with Chapter 3, Design. Design documents shall be prepared by or under supervision of registered or certified professional engineers or architects. However, the Center Director or designee has the authority to waive this requirement if he/she is satisfied the technical design is being performed by qualified personnel. If this requirement is waived, it must be in writing, signed by the Center Director or designee, and filed in the project folder.

1.3.16.7 **Project Design Approval** -- The Center Director or designee shall indicate technical approval by signing the design documents. This approval certifies that the design meets the scope (capability, schedule, and cost) of the approved project as described on the project documents. In addition to specific project goals and objectives, the following apply to facility projects:

a. 14 CFR Part 1216, Environmental Quality, requires an environmental analysis for each project and an environmental assessment for each discrete project unless the action is one normally requiring an environmental impact statement or the action is categorically excluded.

b. 10 CFR Part 434, Energy Code for New Federal Commercial and Multi-Family High Rise Residential Buildings, establishes energy conservation performance standards that are mandatory for design of federal buildings.

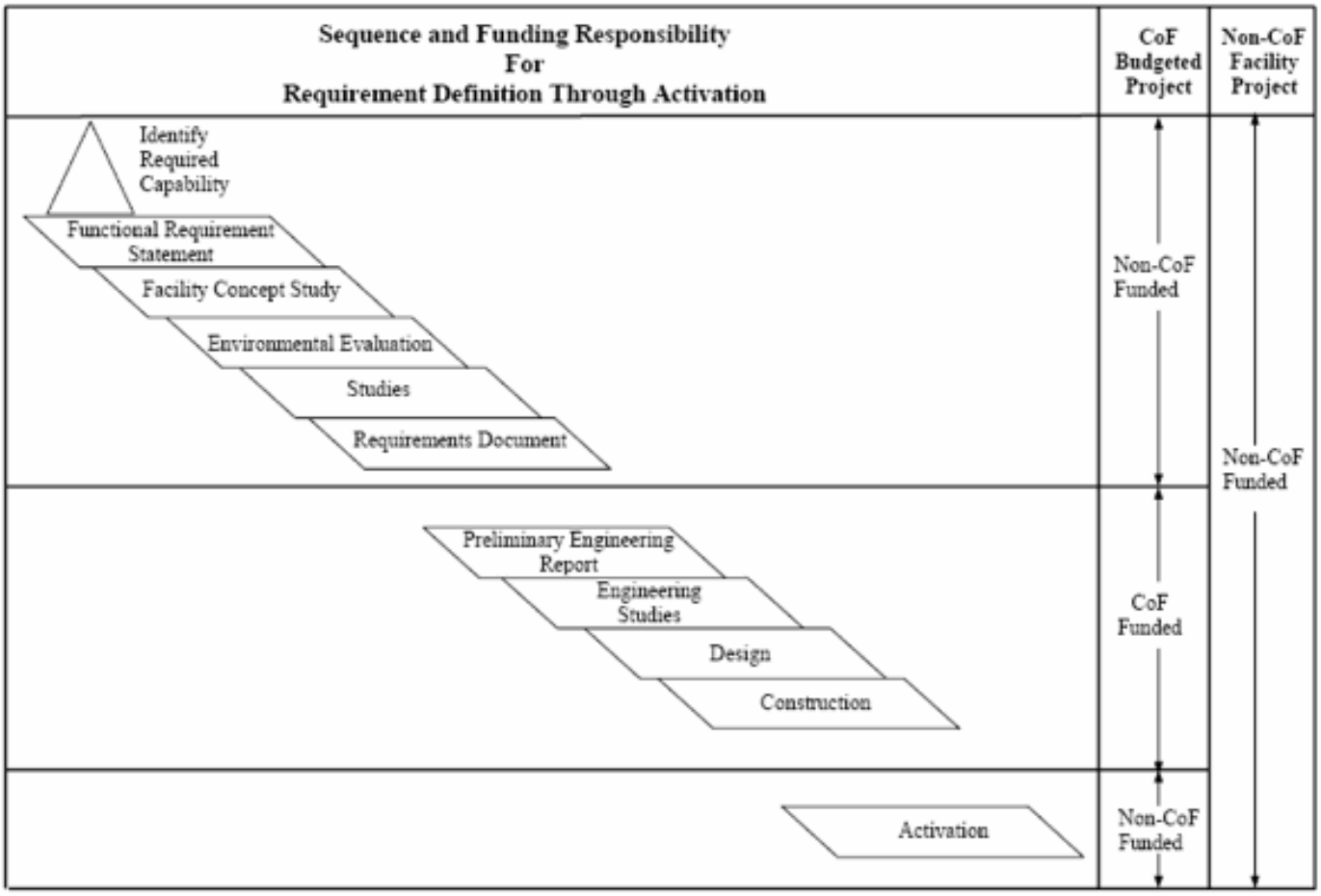


Figure 1-3 Facilities Project Activities and Funding

1.3.17 **Program Reporting Requirements** -- Center CoF Managers shall maintain records for each CoF project and report the following:

1.3.17.1 **Quarterly Report** -- Unless the Headquarters program manager has access to current project status via a Center electronic project management system, the Center CoF Manager shall report quarterly updates to the Headquarters program manager. At a minimum, the report will include the following:

a. Program-related requirements, such as capability, schedule, cost.

b. A 30-percent and 90-percent design milestones including estimated and actual start, review dates, and completion dates.

c. Construction milestones, including estimated and actual start dates, work packages, phases, commissioning, activation, beneficial occupancy, and closeout.

d. Funds management for design and construction: Budget amount (requested during the budget formulation phase), Current Cost Estimate, funds received, funds committed, funds obligated.

e. Outstanding issues, such as significant change orders, safety concerns, or cost overruns and the plans to mitigate these actions.

1.3.17.2 **Functional Performance Metrics** -- On November 1 of each year, CoF Managers

shall report functional performance metrics as requested and communicated by FERPD. See Appendix_C, CoF Self Assessment Metric Form.

1.3.17.3 **Sustainability Reporting Requirements** -- NASA Centers shall submit an annual report of their progress toward implementing sustainability goals. FERPD will request and transmit reporting requirements annually, but the following represent the minimum requirements:

a. Total number of new design projects initiated during the fiscal year.

b. Total number of new designs eligible for LEED registration.

c. Number of new design projects registered for LEED certification and at what level (i.e., Certified, Silver, Gold, or Platinum).

d. Number of completed construction projects eligible for LEED certification and number of completed construction projects achieving LEED certification and at what level (i.e., Certified, Silver, Gold, or Platinum).

Chapter 2. Project Development and Planning

2.1 Facility Project Development

The Center CoF Manager shall develop a systematic process for developing projects for potential inclusion into the CoF process. At a minimum, this process shall include the following:

2.1.1 An annual call for potential projects to Center facility stakeholders.

2.1.2 A method for ongoing collection of requirements throughout the year.

2.1.3 A method for identifying operations and maintenance requirements, such as excessive trouble calls on a system or facility.

2.2 Facility Project Planning

The FAR and the NASA FAR Supplement control all of the acquisition phases for all facility project work. The FPM and Center facility planning office shall coordinate all acquisition planning and execution with the Center acquisition office to ensure compliance with these regulations.

2.2.1 **Center Master Plan** -- The FPM shall ensure assigned CoF projects are in accord with the Center Master Plan.

2.2.2 **Facility Project Manager** -- Centers will assign an FPM for each CoF project. The FPM shall, with support of a project team, organize, manage, and direct facility project work to meet the requirements of this NPR. The project team shall include all project stakeholders, such as representatives from the using organization, safety, health, engineering, fire protection, security, environmental, acquisition, operations and maintenance, and technicians.

2.2.3 **Front End Planning (FEP)** -- The FPM must ensure all project stakeholders take part in FEP, the process of gathering and developing sufficient information to define a facility project. Once the FPM and the planning team have identified the initial project goals and objectives, the FEP process starts and continues through the approval of the design statement of work and the start of final design. The FEP phase establishes the project requirements and concept and provides the basis for project budget and approval. The primary tool used to accomplish FEP is the Project Definition Rating Index (PDRI) (see http://www.hq.nasa.gov/office/codej/codejx/Assets/Docs/ProjectDefinitionRatingIndex.pdf). Initially, the FPM will use the PDRI as a checklist to determine the project areas needing clarification and further study. The FPM and the project team shall evaluate and score the project using the PDRI soon after receiving the 30-percent design documents. If at that time the PDRI score is over 200 out of 1,000 possible points, the project team will identify the problem areas and evaluate the risks to project success. If the risks are low, the project may proceed to final design. If the risks are high, the FPM will further define the project before proceeding with final design. For CoF projects receiving a PDRI score of 300 or more out of 1,000 possible points, the FPM shall prepare a written memorandum outlining the items of low definition and the reasoning behind the decision to proceed. The FPM and the Center CoF Manager must sign and date this

document and keep it on file with the project documents through project closeout.

2.2.4 **Facility Project Requirements** -- The following are required for all facilities projects regardless of fund source:

2.2.4.1 **Functional Requirements Document** -- The FPM shall complete a Functional Requirements Document containing more detail than is found on the NASA Form 1509. It forms the basis for developing documents for budget formulation and/or project approval. It is essential that the detailed requirements in this document are accurate and complete for use in further development of the project. After the Functional Requirements Document is written, it shall undergo a complete review by the project stakeholders including all functional offices necessary to ensure the project complies with internal and external requirements (e.g., safety, security, energy, legal, planning, acquisition, and environmental). The Functional Requirements Document shall include the following elements:

a. A clear and concise statement of purpose for the project.

b. Description of the project, including existing conditions, problems, potential or preliminary solutions, operational need dates, studies, user requests, reports, or Operations and Maintenance (O&M) data. (The FPM shall attach supporting documentation as appendices or at least note how and where it may be obtained).

c. Justification for the project.

d. The statement of work if the project development and design work will be done by contract.

e. The funds source(s) and points of contact for those funds.

2.2.4.2 **Facility Project Management Plan** -- For CoF projects, The FPM shall prepare a Facility Project Management Plan that establishes a schedule for implementing a facility project and assigns roles, responsibilities, and authorities to develop and complete the project. The plan provides a detailed outline of the steps in the facility implementation process with well-defined milestones to measure progress. Prior to start of final design work, the FPM shall present the management plan for approval to the Center official exercising project technical approval authority. For discrete projects, the FPM shall submit the management plan to NASA Headquarters FERPD for review and approval. Management plan approval on discrete projects is required before start of final design (after acceptance of the 30-percent design, see paragraph 3.6.1.1 30-Percent Design). The Facility Project Management Plan shall include the following elements:

a. Identification of the FPM, the project team members, and other individuals or organizations responsible for project implementation.

b. Functional Requirements Document (see paragraph 2.2.4.1).

c. Description of the planned work, including capacity, scope, location, sustainability elements, special features, and Current Cost Estimate (CCE).

d. Identification of all safety, health, environmental, and security requirements.

e. An acquisition plan outlining contract method and schedule that can realistically support the operational need date(s).

f. A project schedule with key milestones for planning, environmental, design, acquisition, construction (include long-lead items; e.g., equipment items that are not typically stocked by suppliers), and activation.

g. Configuration/change control procedures and responsibilities.

h. Description of design review milestones, documentation, fiscal control procedures, and reporting frequency.

2.2.4.3 **Environmental** -- The FPM and the Center Environmental Manager shall ensure an environmental evaluation in accordance with NPR 8580.1, Implementing the National Environmental Policy Act and Executive Order 12114.

2.2.4.4 **Historic** -- For work on existing facilities with potentially historic significance, the FPM and the CEM shall ensure the work is done in compliance with Section 106 regulations, 36 CFR 800, Protection of Historic Properties, of the National Historic Preservation Act (NHPA).

2.2.4.5 **Occupational Safety and Health** -- The FPM and the Center Occupational Safety and Health organization(s) shall identify safety and occupational health requirements in compliance with NPR 8715.3, NASA General Safety Program Requirements and NPR 8715.1, NASA Occupational Safety and Health Programs.

a. The FPM shall prepare the Preliminary Hazard Analysis and the Preliminary Hazard List and initiate the Facility Safety Management Plan (FSMP) containing the Hazard Analysis Tracking Index (HATI) in accordance with NASA-STD-8719.7, Facility System Safety Guidebook.

2.2.4.6 **Security** -- NASA has adopted the Interagency Security Council (ISC) criteria for use in planning and designing new construction and major renovation. The General Services Administration (GSA) Office of the Chief Architect makes these criteria available on their Building Security Technology Web site.

2.2.4.7 **Risk Management** -- If applicable to any portion of a CoF project, the FPM shall ensure compliance with the risk management process as outlined in NPR 8000.4, Risk Management Procedural Requirements. The referenced NPR describes applicability.

2.2.4.8 **Energy Efficiency and Water Conservation** -- The FPM shall ensure the project incorporates the energy efficiency and water conservation requirements in 10 CFR Part 434, Energy Code for New Federal Commercial and Multi-Family High Rise Residential Buildings; NPR 8570.1, Energy Efficiency and Water Conservation; and the following:

a. **Energy Efficiency** -- The FPM shall ensure the project designer:

1. Establishes a whole building performance target that takes into account the intended use, occupancy, operations, plug loads, other energy demands, and design to earn the Energy Star7 targets for new construction and major renovation where applicable.

2. For new construction, reduce the energy cost budget by 30 percent compared to the baseline building performance rating per the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., (ASHRAE) and the Illuminating Engineering Society of North America (IESNA) Standard 90.1-2004, Energy Standard for Buildings Except Low-Rise Residential.

3. For major renovations, reduces the energy cost budget by 20 percent from prerenovations 2003 baseline.

b. **Protect and Conserve Water** -- The FPM shall ensure the project designer:

1. For indoors, reduces the potable water consumption of latrine fixtures (e.g., showerheads, faucets, water closets, and urinals) by at least 20 percent from the baseline as calculated using the Energy Policy Act of 1992 fixture performance standards.

2. For outdoors, reduces outdoor potable water consumption by a minimum of 50 percent over that consumed by conventional means (plant species and plant densities) by using water-efficient landscape and irrigation strategies, including water reuse and recycling.

3. Minimizes storm water runoff and polluted site water runoff.

2.2.4.9 O&M -- The FPM shall coordinate all facility project designs and planning with the Center O&M organization. All designs shall comply with accepted maintenance policies, including the following:

a. The Reliability Centered Maintenance Guide for Facilities and Collateral Equipment (see http://www.hq.nasa.gov/office/codej/codejx/Assets/Docs/RCMGuide Mar2000.pdf).

b. The Reliability Centered Building and Equipment Acceptance Guide (RCBEA, see http://www.hq.nasa.gov/office/codej/codejx/Assets/Docs/RCB&EGuideJUL04.pdf).

c. NPR 8831.2, Facilities Maintenance Management (see http://nodis3.gsfc.nasa.gov/displayDir.cfm?Internal_ID=N_PR_8831_002D_&page_name=main).

d. Predictive Testing & Inspection (PT&I).

e. Computerized Maintenance Management System (CMMS) requirements.

f. The FPM shall ensure that O&M manuals on the installed systems and equipment are written and that training (including certification training for complex technical systems) is accomplished. For real property systems and equipment, these costs shall be included in the CoF budget. For noncollateral equipment and systems, these costs shall be included in the activation budget (non-CoF).

2.2.4.10 **Sustainability** -- NASA has adopted the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) as its performance measure for sustainable development. For CoF projects, all new construction and major building renovation projects planned for award after October 1, 2005, shall meet the minimum LEED Silver rating. The FPM will evaluate (risks, benefits, and costs) and provide an executive summary to FERPD identifying the additional requirements to meet a LEED Gold rating. If LEED Silver cannot be achieved on projects, the FPM will request a waiver from FERPD. The FPM must ensure compliance with Executive Order (EO) 13423, Strengthening Federal Environmental, Energy, and Transportation Management (see http://a257.g.akamaitech.net/7/257/2422/01jan20071800/edocket.access.gpo.gov/2007/pdf/07-374.pdf) and the following:

a. **Commissioning** -- Total building commissioning as defined in United States Green Building Council's LEED standard is required on all new construction and major renovation projects. Commissioning of installed items and associated systems on all other projects is required.

b. **Exemptions** -- Projects incapable of qualifying for LEED Silver certification (e.g., small, single system, or equipment) shall incorporate life-cycle cost sustainable design principles to the maximum extent practicable to reduce the overall life-cycle cost and minimize impacts on natural resources.

c. **Construction Waste** -- During the planning stage, local recycling and salvage operations that could process site-related waste will be identified. The designer shall incorporate into the construction contract documents to have the contractor recycle or salvage at least 50 percent of construction, demolition, and land-clearing waste, excluding soil, where markets or onsite recycling opportunities exist.

d. **Other Construction Standards** -- The FPM shall ensure compliance with the following standards or guidance:

1. **Indoor Air Quality During Construction** -- Sheet Metal and Air Conditioning Contractors' National Association Indoor Air Quality Guidelines for Occupied Buildings under Construction, 1995. After construction and prior to occupancy, a minimum 72-hour flush out with maximum outdoor air must be conducted, consistent with achieving relative humidity no greater than 60 percent. After occupancy, continue flush out as necessary to minimize exposure to contaminants from new building materials.

2. **Ventilation and Thermal Comfort** -- The current ASHRAE Standard 55-2004, Thermal Environmental Conditions for Human Occupancy, including continuous humidity control within established ranges per climate zone, and ASHRAE Standard 62.1-2004, Ventilation for Acceptable Indoor Air Quality.

3. **Moisture Control** -- Moisture control strategy for controlling moisture flows and condensation to prevent building damage and mold contamination.

4. **Daylighting** -- A minimum daylight factor of two percent (excluding all direct sunlight penetration) in 75 percent of all spaces occupied for critical visual tasks. Automatic dimming controls or accessible manual lighting controls and appropriate glare control must be provided.

5. **Low-Emitting Materials** -- Use of materials and products with low-pollutant emissions (e.g., volatile organic compounds), including adhesives, sealants, paints, carpet systems, and furnishings.

6. **Biobased Content** -- Use of products meeting or exceeding United States Department of Agriculture's biobased content recommendations. For other products, biobased products made from rapidly renewable resources and certified sustainable wood products must be used. (See http://www.biobased.oce.usda.gov/fb4p/)

7. **Ozone-Depleting Compounds** -- Eliminating the use of ozone-depleting compounds during and after construction where alternative environmentally preferable products are available, consistent with either the Montreal Protocol and Title VI of the Clean Air Act Amendments of 1990 or equivalent overall air quality benefits that take into account life-cycle impacts.

8. **Recycled Content** -- For EPA-designated products, use of products meeting or exceeding EPA's recycled content recommendations. For other products, materials with recycled content must be used such that the sum of postconsumer recycled content, plus one-half of the preconsumer content, constitutes at least 10 percent (based on cost) of the total value of the materials in the project.

2.2.4.11 **Cost Estimate** -- The FPM shall prepare or ensure their assigned CoF projects have a cost estimate. This estimate must include every element described in the project Functional Requirements Document with enough accuracy to have a reasonable expectation of project success. For CoF projects, NASA Form 1510, Facility Project Cost Estimate, summarizes this estimate with sufficient detail for review. When applicable to the specific project, estimates for the following major elements are required:

a. Site preparation, utilities, sidewalks, parking lots, and roads.

b. Construction materials and labor.

c. Material and equipment tests performed at the construction site or at an offsite location.

d. Construction management services.

e. Commissioning services during design and construction.

f. Environmental compliance and protection.

g. Collateral equipment.

h. Subcontractor and general contractor cost, overhead, and profit.

i. Insurance bonds and taxes.

2.2.4.12 **Budget and Approval Documents** -- For MRCs (see paragraph 1.1.2), the Center CoF Program or Project Manager shall submit NASA Forms 1509 and 1510. In addition, discrete projects must have a budget narrative (i.e., Long Form Writeup) and a Life-Cycle Cost Analysis (LCCA) in compliance with OMB Circular A-94 using ECONPACK (http://www.hq.usace.army.mil/cemp/e/ec/econ/econ.htm).

2.2.5 **Codes and Standards** -- The FPM must ensure designs meet or exceed locally adopted, nationally recognized building codes and standards.

2.2.5.1 In the case where a local jurisdiction has adopted a code that is not nationally recognized, the FPM shall ensure the design meets or exceeds the International Building Code from the International Code Council.

2.2.5.2 Regardless of locally adopted building codes, the FPM shall ensure the design meets or exceeds the National Fire Protection Association requirements for electrical systems, life safety, and fire protection, detection, and suppression.

2.2.5.3 All CoF design drawings shall comply with the U.S. National Computer Aided Design Standard (see http://www.nationalcadstandard.org/).

2.2.5.4 For all CoF project specifications, designers shall use SpecsIntact, i.e., the Uniform Facilities Guide Specifications (UFGS) found in the Whole Building Design Guide (WBDG) (see http://specsintact.ksc.nasa. gov/ and http://www.wbdg.org/). For equipment or systems not adequately specified by using the UFGS, the designer may use professional judgment.

2.2.6 **Activation Budget Formulation** -- The FPM shall include budget formulation planning for activation during the planning phase of the project. The purpose is to identify costs associated with activation and ensure funds are available at the time activation starts. The budget planning must identify all costs necessary to outfit the facility for its intended operation and the source(s) of funding (see Chapter 5, Activation for details). NASA Form 1509 will include the estimated activation costs for the project. For discrete projects, the long form writeup must include the activation costs and scope.

Chapter 3. Design

3.1 Design Coordination

The FPM must keep the project team apprised of significant developments throughout the design phase.

3.2 Architectural-Engineering (A-E) Services

Whenever A-E services are required, the FPM and Center Procurement Office shall acquire those services in accordance with the FAR and the NASA FAR supplement.

3.3 Public Release

Public disclosure of CoF project information (including subprojects and/or work packages) shall occur only after release by the appropriate committees of Congress. Design documents prior to their planned construction fiscal year of execution are sensitive, and the FPM must ensure that all parties connected with project development are cognizant of this sensitivity. Design packages used for acquisition must not include any information classified as "for official use only," secret, or top secret. The FPM may share CoF project information once the designer or contractor is under contract but only after the Center Office of Security approves the action. Any information deemed sensitive but unclassified must be handled in accordance with NPR 1600.1, NASA Security Program Procedural Requirements.

3.4 Management of Design

It is NASA policy to award CoF projects early in the fiscal year in which it is planned. The FPM must plan and manage CoF program projects to support reaching the goal of awarding during the second quarter of the fiscal year.

3.5 Preliminary Engineering Report (PER)

The FPM shall ensure a PER is performed on any assigned CoF project having significant technical or financial risks associated with it (e.g., employing leading-edge technology, highly technical, complex, or with incremental funding). If a PER is performed for a project, the PDRI score shall be determined soon after its conclusion (see paragraph 2.2.3, Front End Planning). If a PER is required, it must include the following sections:

3.5.1 **Section I: Requirement Statement and Justification** -- Describe and justify the project requirements, problems, and milestones. Center directives will be referenced to support the requirements and required completion date.

3.5.2 **Section II: Descriptive Analysis** -- The problems and solutions identified must be explained with sufficient detail to adequately make rational decisions. Include schematics and one-line diagrams showing the functions and operations to be performed within the facility. A life-cycle cost analysis that meets the requirements of paragraph 2.2.4.12., Budget and Approval Documents, must be developed and provided for each alternative. Each alternative will include discussions on the pros, cons, risks, and analyses for meeting the project requirements including safety, fire protection, energy conservation, environmental, operations and maintenance considerations, and sustainability. Where applicable, each alternative must include information on architectural, site development, structural, mechanical, and electrical considerations; real estate actions; and any affected utilities. Real estate requirements, including acquisitions and easements, will be addressed in this section; Section III, Engineering, Budget, and Other Estimates; and a dedicated appendix (see paragraph 3.5.5.2, Real Estate Interest, below). If there are no real estate requirements, it must be clearly stated in this section.

3.5.3 **Section III: Engineering, Budget, and Other Estimates** -- The PER cost estimates will be prepared on NASA Form 1510, Facility Project Cost Estimate, in accordance with Appendix C, Forms and Instructions. The cost estimating process includes Engineering Estimates (EE), budget estimates, and other cost estimates.

3.5.3.1 **The Engineering Estimate (EE)** -- This represents the CoF costs developed from the draft project documents (drawings and specifications) prepared for the PER. The estimate includes the costs for materials, labor, real estate actions, and services, including contractor overhead and profit. Adequate design contingencies must be included. The EE must include all labor and material costs for all items including collateral equipment that would normally be furnished by a contractor and installed as permanent in the facility (see Appendix D, Facility and Other Related Costs, for a listing of items and types to include). When applicable, the cost to install Government Furnished Property (GFP) will be included. The EE must not include escalation, construction contingencies, or Supervision, Inspection, and Engineering Services (SIES). The basis or source used will be indicated on the estimate. Estimates will identify funding requirements by fiscal year(s) and amount(s). The EE must include unit costs (e.g., units of measure and quantities for each significant item) instead of lump sum estimates whenever feasible. The EE is the estimate used for comparing alternatives within the PER.

3.5.3.2 **Operations and Maintenance (O&M) Cost Estimate** -- An O&M cost estimate covering the expected life of the facility must be included for each feasible alternative in the PER. This cost estimate will include estimated energy and maintenance costs for installed systems over the expected life of the facility.

3.5.3.3 **The Budget Estimate** -- This estimate includes the EE of the selected alternative, escalation, construction contingencies, commissioning services, and SIES. This estimate will follow the same guidelines for unit costs as outlined in the prior paragraph. The total budget estimate becomes the budget amount (BA) after it has been submitted to OMB and is the BA for this project on all future reports to HQ (see paragraph 1.3.17, Program Reporting Requirements).

3.5.3.4 **Other Cost Estimate** -- Project requirement costs not covered in the prior two paragraphs should be included within the PER, but annotated separately. For example, non-real property equipment, furniture, and telecommunications equipment required to meet the project goals and objectives fit under this heading.

3.5.4 **Section IV: Design and Construction Schedule** -- Provide a project schedule using a commercially available project planning software and identify the software in the PER. If a predetermined need date has been established for the facility, it shall be shown in the schedule. The

schedule must address requirements for other Architectural-Engineer (A E) services, long lead items, special approvals, and other special requirements. If more than one construction contract is contemplated, an estimate of the time required for each major contract and the phasing will be provided. The schedule must include the estimated number of months required for each of the following:

a. Preparing the final design documents.

b. Construction acquisition.

c. Construction.

d. Facility activation.

3.5.5 Section V: Appendices to the Report

3.5.5.1 **Drawings** -- As required for clearly illustrating the project, drawings for the PER will include a location plan, site plan, single-line floor plans, and elevations. The drawings must be in 8-1/2 by 11-inch format. Foldouts are acceptable if the vertical dimension is kept to 11 inches. On the drawings, particular attention must be paid to illustrate effective land use. Any proposed land-acquisition requirements, including easements, must be indicated on the site plan. Required safety clearance distances, when applicable, must be shown on the site plan.

3.5.5.2 **Real Estate Interest** -- For those projects requiring additional real estate (on- or offsite) or easements, an appendix must be included in the PER and address the following items:

a. A tabulation segregated by type of ownership (i.e., private, State, or public domain) of only the acreage proposed for acquisition plus easements for access and utilities. The tabulation will include the assessed value of land, assessed value of improvements, current appraised value, and the number of owners involved.

b. The extent of any street or road closings and the extent of any road or utility relocations, including a cost estimate for such closings and/or relocations, separate from the land values indicated above.

c. The extent and estimated costs of required additional rights such as mineral rights, timber rights, and easement rights whether outstanding in parties other than the present owners or not, and a statement as to whether title should be taken in fee simple absolute or subject to such rights.

d. A lease-purchase analysis as required by OMB Circular No. A-94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs, when a decision has been made to lease or purchase (construct) general-purpose real property.

e. Compliance with EO 12372, Intergovernmental Review of Federal Programs or the basis of exception. Completing an Environmental Impact Statement, Finding of No Significant Impact, or Environmental Assessment satisfies this requirement.

3.5.5.3 **Ancillary Investigations** -- Any supplementary investigations or studies used to enhance, develop, or eliminate alternatives, such as soil conditions, environmental studies, marketing strategies, or feasibility studies, must be either attached to or summarized in the appendices.

3.6 Design Milestones

Regardless of the acquisition strategy selected (e.g., design-build or design-bid-build), the FPM shall ensure that all facilities projects are designed to at least the 30 percent stage prior to advertising for construction.

3.6.1 For facilities projects requiring a complete design prior to construction advertisement, the minimum design milestones are 30 percent and 90 percent. In addition to ensuring the design is coordinated with the project stakeholders during design meetings, the FPM shall distribute 30 percent and the 90-percent design documents to the project stakeholders for review. The following minimum elements must be included for these stages:

3.6.1.1 30-**Percent Design Documents** -- Besides the documentation required in paragraph 2.2.4., Facility Project Requirements, this package must include the following:

a. For new construction or an addition to an existing building, a site plan in accordance with the Center Master Plan.

b. A floor plan, building envelope details (e.g., finishes, roofs, walls, and floors), structural systems, mechanical systems, electrical systems, construction phasing plan, draft commissioning plan, and draft activation plan.

c. Design analysis supporting the basis for the design with calculations. The analysis must contain important assumptions, standards, codes, and other constraints used to determine final selections. The package will include section numbers and titles for all specifications planned.

3.6.1.2 **90-Percent Design Documents** -- The design documents submitted for review will be a completely detailed set of technical design contract documents in final form. They will include the following:

a. A complete set of drawings and specifications with sufficient detail for a prudent contractor to complete the work.

b. A final cost estimate in accordance with paragraph 3.5.3, Section III: Engineering, Budget and Other Estimates.

c. A construction schedule with key milestones for long-lead items, phases clearly delineated, and activation.

3.7 Design Reviews

The corresponding Center Mission Support Offices shall review both the 30--- percent and the 90-percent design stages for constructability, environmental compliance, sustainability, safety, security, health, and code compliance.

3.8 Mission-Critical Systems

For mission-critical technical facilities (for definition, see NPR 7120.5, NASA Space Flight Program and Project Management Requirements) specifically developed or significantly modified for space flight systems and associated ground systems, then the FPM shall comply with both NPR 7120.5 and this document. Where compliance to both policies would duplicate an effort (e.g. a project management plan), only one effort incorporating all required elements from both policies is necessary. For complex or mission-critical systems, the FPM must ensure a Failure Mode and Effects Analysis (FMEA) is accomplished in accordance with NASA STD 8719.7, Facility System Safety Guidebook.

3.9 Facility Activation Plan

For new construction and major renovation projects, the FPM shall develop a facility activation plan during the design phase. This plan will outline the process steps and resources necessary for project implementation. The activation plan must address the following items, as applicable to the specific project:

a. Noncollateral equipment purchase and installation. For noncollateral equipment no longer needed within an existing facility, refer to NPR 4200.1, NASA Equipment Management Procedural Requirements.

b. Subsystem tests (list each, list test limits, and the PT&I technology to be used).

c. Integrated systems test plan and test.

d. Integrated systems safety and occupational health review.

e. Operational readiness review.

f. Facility systems training.

g. Estimated yearly budget for Operations and Maintenance (O&M) for installed systems.

h. O&M instructions; PT&I, and CMMS information; and manuals.

i. Prefinal inspections.

j. Final inspections.

k. Punch list (close out).

l. Facility and systems as-builts.

m. Warranty transfer.

n. Final facilities construction contract closeout.

o. Contractor performance records.

p. Data systems design and installation.

q. Systems furniture design, purchase, and installation.

r. Telecommunications equipment installation.

s. Personnel move in.

t. Transfer to customer and O&M organization.

3.9.1 Prior to completion of the final design work, the office exercising project approval authority shall review and approve the activation plan.

3.10 Activation Budget

The FPM shall complete the activation budget started in the planning process (see paragraph 2.2.6, Activation Budget Formulation) and submit it during the normal budget process through the Center OCFO. The activation budget includes estimated costs associated with all tasks necessary to verify that the facility meets the project requirements, the systems operate within the design parameters, and the facility and operating organization are ready to use and maintain the facility. The budget

includes all costs necessary to outfit the facility for personnel move in and its intended operation (i.e., installation of ground support equipment, integration and checkout of combined facility and noncollateral equipment systems, installation of computer data wiring and systems, installation of systems furniture, and installation of telephone systems). The FPM will include the activation estimate on NASA Form 1509. For discrete projects, the Long Form Writeup also includes the activation costs and scope.

Chapter 4. Construction

4.1 Acquisition of Construction

The designated Contract Officer (CO) is the only person with authority to obligate the Federal Government in acquiring and executing contracts. The construction phase includes preparation of the acquisition package, advertisement, negotiation, contract award, construction management, construction inspection, change control management, commissioning, and activation startup. The FPM or designee represents the CO as the Contracting Officer's Technical Representative (COTR) within the limitations granted and responsibilities assigned by the CO. The project team shall continue to provide support during this phase, especially during the change control process.

4.2 Preparation of the Acquisition Package

The CO shall provide direction for the required content of the acquisition package; however, at a minimum, it will include a Government cost estimate, the design documents, and either funds or a planning purchase request with the funds source identified (see paragraph 1.3.16.3., Requesting Funds).

4.3 Advertisement

Facility project acquisitions shall comply with the FAR and the NASA FAR supplement. For CoF projects, the acquisition process will begin only after the Authority to Advertise has been received from HQ FERPD. Funds and/or authority to advertise prior to receipt of funds may be requested when the final design is 90-percent complete and the following are submitted via a CoF Routine Transaction Form:

a. A locally approved and signed NASA Form 1509 and 1510 for each project,

b. For discrete projects, the approved Facility Project Management Plan (see paragraph 2.2.4.2., Facility Project Management Plan) submitted by the FPM or COTR.

4.4 Receipt of Bids or Negotiation

The CO is responsible for bidding and negotiating construction contracts, but the COTR shall provide technical support and advice at the CO's request.

4.4.1 The COTR shall prepare and submit the NASA Form 1579, Flash Bid Report, to FERPD immediately following the bid evaluation and the CO's acceptance of the bids as responsive.

4.5 Contract Award

Contract award is the CO's responsibility. The COTR may be called upon to provide assistance prior to and during the award process.

4.6 Construction Management

During the administration of the construction contract, the COTR shall perform partnering for all facilities projects as defined in NFS Subpart 1836.70, Partnering, 48 CFR Chapter 18 (http://www.hq.nasa.gov/office/procurement/regs/1836.doc).

4.6.1 The COTR shall apply change controls during the preconstruction conference (or immediately after the notice to proceed is issued) to ensure all involved with the contract understand who is responsible for directing changes and how they will be administered.

4.6.2 Either the CO or the COTR shall brief all project stakeholders on contract administration and change control procedures.

4.6.3 The COTR also shall carry out the following:

a. Ensure the facility is constructed in accordance with the contract documents.

b. Prepare and process status reports and inspection logs.

c. Review contractor safety and health plan with representatives from Center occupational safety and health organizations.

d. Review and approve contractor submittals.

e. Process contractor requests for progress payments and requests for information.

f. Review and approve change requests.

g. Maintain the project Current Cost Estimate (CCE), highlighting approved and potential changes in the project cost and schedule.

h. Ensure the preparation and delivery of O&M instructions; Reliability Centered Maintenance (RCM), PT&I, and CMMS information; and as-built drawings.

i. Use the Reliability Centered Building and Equipment Acceptance Guide (see http://www.hq.n
http://www.hq.nasa.gov/office/codej/codejx/Assets/Docs/RCB&EGuideJUL04.pdf) during the final inspection and acceptance of installed systems.

j. Prepare or oversee the preparation of real property vouchers and transfer documents.

k. Complete final project closeout.

4.7 Real Property Capitalization

After acceptance of the project is accomplished, the FPM and the COTR assist the Center Real Property Accountable Officer (CRPAO) in capitalizing and classifying the real property. The FPM and the COTR, with guidance from the CRPAO, shall fill out NASA Form 1046, Transfer and/or Notification of Acceptance of Accountability of Real Property (seehttps://pollux.hq.nasa.gov/nef/user/form_search_list.cfm?prefix=all&search_type=n&chart https://pollux.hq.nasa.gov/nef/user/form_search_list.cfm?prefix=all&search_type=n&chart_number=1046&chart_number_like=Like). This form is required for new construction, building additions, and other significant changes to real property.

Chapter 5. Activation

5.1 Activation

Facility activation involves the completion of facility projects, including facility outfitting, subsystems and integrated systems tests, final inspection and acceptance, final cost closeout, and release to the customer and O&M organizations.

5.2 Facility Outfitting

Projects or tasks associated with facility outfitting cannot be funded with CoF funding (see Appendix A, "outfitting"). Outfitting includes the following items:

a. Noncollateral equipment installation.

b. Data systems installation.

c. Systems furniture installation.

d. Telephone installation.

e. Furniture and equipment move in.

f. Personnel move in.

g. Maintenance services startup.

5.3 Beneficial Occupancy Prior to Completion

With CO approval, beneficial occupancy of the facility or a portion of the facility may be allowed prior to final acceptance. The CO shall provide the contractor with a list of outstanding work for those areas the Government intends to use. Taking beneficial occupancy does not absolve the contractor from completing the contractual agreement.

5.4 Completion and Acceptance of Installed Systems

The COTR shall ensure inspections and tests are performed for equipment and installed systems to validate http://www.hq.nasa.gov/office/codej/codejx/RCBE0201Final.doc compliance with O&M requirements identified in the Facility Project Management Plan (see paragraph 2.2.4.9) and the Reliability Centered Building and Equipment Acceptance Guide (see http://www.hq.nasa.gov/office/codej/codejx/Assets/Docs/RCB&EGuideJUL04.pdf).

5.5 O&M Manuals and Training

During the activation phase, the FPM shall ensure that the O&M staff are trained on and provided with O&M manuals for installed systems and equipment.

5.5.1 For real property, funding for this effort will be in the CoF budget.

5.5.2 For noncollateral equipment and systems, funding will be from activation budget source(s).

Appendix A. Definitions

A-1 **Activation** -- the portion of the total facility acquisition process that normally follows construction. It includes the installation of ground support equipment, the integration and checkout of combined facility and equipment systems, installation of noncollateral equipment, and demonstration and acceptance of an operable facility.

A-2 **Addition, Expansion, Extension** -- a physical increase to a real property facility that adds to the overall dimension of the facility.

A-3 **Administrator** -- the top executive of NASA.

A-4 **Agency** -- any executive department, commission, authority, administration, board, or other independent establishment in the executive branch of the Federal Government, including any corporation wholly or partly owned by the United States and which is an instrumentality of the United States. The term as used herein does not include the municipal government of the District of Columbia.

A-5 **Apportionment** -- act of distributing according to a plan or set apart for a special purpose. OMB is responsible for apportioning NASA's appropriated funds.

A-6 **Appropriation** -- statutory authority that allows Federal agencies to incur obligations and make payments out of the U.S. Treasury for specific purposes. An appropriation usually follows enactment of authorizing legislation. The following is a list of typical appropriation terms:

a. **Annual Appropriation** -- an appropriation that is available for incurring obligations only during one fiscal year specified in the annual Appropriation Act.

b. **Continuing Appropriation** -- an authority to incur obligations until funds are exhausted or to achieve a specific objective.

c. **Current Appropriation** -- an appropriation that is available for obligation during the current fiscal year.

d. **Lump Sum Appropriation** -- an appropriation in a specified amount made for a complete program without prescribing limitation of outlays within the stated purpose and amount.

e. **Multiple-Year Appropriation** -- an appropriation that is available for incurring

obligations for a definite period in excess of one fiscal year (e.g., CoF).

f. **No-Year Appropriation** -- an appropriation that is available for incurring obligations for an indefinite period of time.

g. **One-Year Appropriation** -- an appropriation available for obligations only during one specified year.

A-7 **At-Risk Project** -- a project for which one of the following applies:

a. Final design has not started by the end of May preceding the fiscal year in which the project is proposed for Congressional authorization, or not completed by February of the fiscal year in which the project was authorized and appropriated.

b. The project scope as presented to Congress has significantly changed.

c. Construction award has not been made or is not scheduled to occur by June of the fiscal year in which the project was authorized and appropriated.

d. Modification projects that are not awarded within six months after the date of release of the construction funds. (See "Modification.")

Funding allocation may be lost when a project is at risk. The resources allocated to an at-risk project can then be made available for satisfying shortages in Congressional appropriations or be used to fund projects at locations where resources will be obligated in a timely manner.

A-8 **Authorization** -- is a legislative act authorizing money to be spent for Government programs that specify a maximum spending level without provision for actual funds.

A-9 **Beneficial Occupancy Date** -- the date a contractor releases and NASA accepts occupancy of a facility or portion of a facility.

A-10 **Bid Opening Date** -- the date when all sealed bids must have been received by the Government and when all bids are opened and recorded for an Invitation for Bid.

A-11 **Brief Project Document** (NASA Form 1509) -- See Facility Project-Brief Project Document.

A-12 **Budget** -- a formal estimate of future revenues, obligations to be incurred, and outlays to be made during a defined period and, when determined to be appropriate, based on accrued expenditures and costs to be incurred.

A-13 **Budget Cycle** -- the period that elapses from the initiation of the budget process to the completion of the budget process for a particular fiscal year.

A-14 **Budget Estimate** -- a fund requirement for any element included in a budget. Collectively, all estimated fund requirements for a particular operating agency or

component or consolidation thereof.

A-15 **Budget Process** -- the process encompassing all phases of funding formulation through execution.

A-16 **Budget Year** -- the fiscal year of execution, covering the period from October 1 through September 30 (see "Fiscal Year").

A-17 **Category A** -- used for minor projects to indicate that the requirement for the project was included in a Congressional budget submission. For substitution projects, see "Modification."

A-18 **Centers** -- primary NASA field installations, each led by a Center Director. The following are Centers:

a. Ames Research Center (ARC).

b. Dryden Flight Research Center (DFRC).

c. Glenn Research Center (GRC) at Lewis Field.

d. Goddard Space Flight Center (GSFC).

e. Jet Propulsion Laboratory (JPL).

f. Johnson Space Center (JSC).

g. Kennedy Space Center (KSC).

h. Langley Research Center (LaRC).

i. Marshall Space Flight Center (MSFC).

j. Stennis Space Center (SSC).

A-19 **Center Director** -- the top executive at a NASA Center.

A-20 **Change in Scope** -- a change in objectives, work plans, or schedules that results in a material difference from a prior approval from a higher authority.

A-21 **Change Order** -- a written direction from the CO to the contractor modifying the contract as awarded.

A-22 **Chief Financial Officer** -- the official in charge of all fiscal and financial plans and operations.

A-23 **Collateral Equipment (also see "Noncollateral Equipment")** -- building support equipment and large, substantially affixed equipment/property. It is normally acquired and installed as a part of a facility project and includes the following:

a. Building support equipment that normally is required to make a facility useful and

operable. It is built in to the facility, and its removal would impair the usefulness, safety, or environment within the facility (e.g., elevators, transformers, compressors, heaters, ventilators, and air-conditioners). It also includes systems and subsystems, such as electrical, plumbing, pneumatic, fire protection, fire suppression, control systems, and monitoring systems.

b. Large, substantially affixed equipment or property of any type other than building support equipment that is built in such that the installation costs including building envelope modifications, special foundations, and utility service exceed $300,000.

A-24 **Completion Date** -- when the Government formally accepts an item of work from a contractor. The date on which the Government accepts all contract deliverables is the contract completion date.

A-25 **Component Facilities** -- NASA installations geographically separated from the NASA Centers to which they are assigned (see "Centers"). The Component Facilities annotated with their assigned NASA Centers are as follows:

a. **Deep Space Network** -- Goldstone, CA; Canberra, Australia; Madrid, Spain; (JPL).

b. Ground Network at KSC (GSFC).

c. Independent Verification and Validation Facility (IV&V) (GSFC).

d. Michoud Assembly Facility (MAF) (MSFC).

e. NASA Management Office (NMO)/JPL (HQ/Science Mission Directorate).

f. Palmdale (JSC).

g. Plum Brook Station (PBS) (GRC).

h. Santa Susana Field Laboratory (MSFC).

i. Space Network (White Sands, NM) (GSFC).

j. Wallops Flight Facility (Wallops Island, VA) (GSFC).

k. White Sands Test Facility (WSTF) (JSC).

A-26 **Computerized Maintenance Management System (CMMS)** -- computer software that is used to monitor, plan, and schedule facility and equipment maintenance functions. They provide historical data, report writing capabilities, job analysis, and more. The data describes equipment, parts, jobs, crafts, costs, step-by-step instructions, and other information involved in the maintenance effort. This information may be stored, viewed, analyzed, reproduced, and updated with just a few keystrokes. The maintenance-related functions typically include the following:

a. Facility/equipment inventory.

b. Facility/equipment history.

c. Work input control.

d. Job estimating.

e. Work scheduling and tracking.

f. Preventive and predictive maintenance.

g. Facility inspection and assessment.

h. Material management.

i. Utilities management.

A-27 **Constructability** -- a review of the design documents from a practicality, cost effectiveness, and efficiency perspective. The review includes verifying the integration of the drawings with the various professional disciplines and clarity of the design. It also includes review for maintainability and operability.

A-28 **Construction** -- the erection or modification of real property required to support a new capability, including additions, sidewalks, parking lots, driveways, and upgrades. This includes alterations to existing facilities that change the original purpose of the facility (e.g., remodeling a warehouse, or portion thereof, into office space).

A-29 **Construction Contractor** -- a business entity (i.e., person, corporation, partnership, or joint venture) that has satisfied the CO that they are qualified to perform the work as described in the construction contract documents.

A-30 **Construction of Facilities** -- a NASA corporate program that funds planning for future facility needs, design of facilities projects, revitalization projects (repair, rehabilitation, and modification of existing facilities), construction of new facilities, and acquisition of collateral equipment.

A-31 **Contingency (Construction)** -- an allowance included in a construction cost estimate to cover uncertainties during the construction phase of the project, such as changes in site conditions and construction interferences.

A-32 **Contingency (Design)** -- an allowance included in the engineering estimate to allow for added unanticipated costs due to design uncertainties and incomplete or changing user requirements.

A-33 **Contract** -- either an agreement or an order for the acquisition of supplies or services signed by a CO.

A-34 **Contract Award Date** -- the date the CO signs the contract.

A-35 **Contract Officer** -- any person who has the authority to acquire, administer, or

terminate contracts. The term includes specifically authorized representatives of the CO acting within the limits of their authority as delegated by the CO.

A-36 **Contracting Officer Technical Representative** -- an authorized representative with technical understanding of the project and acting under the authority delegated by the CO.

A-37 **Contractor Safety and Health Plan** -- a comprehensive written document, specific to the scope of work, and applicable to all subcontractors, explaining how the construction contractor will affirmatively and proactively assess work for hazards; comply with applicable Federal, state and local and NASA health and safety requirements; and provides controls for the specific hazards identified.

A-38 **Current Cost Estimate** -- an estimate that is the latest and best professional cost estimate for a given project at any given time during planning, design, or construction. It is the estimated cost for labor, materials, and services to complete a planned facility project. It includes an estimate for land acquisition, site work, construction, and the purchase and installation of collateral equipment. It must include a reasonable estimate for contingencies. If a construction agent will manage the project for NASA, this estimate includes the agent's contract cost.

A-39 **Current Year** -- the present fiscal year (October 1 through September 30).

A-40 **Design** -- the process of developing, planning, and communicating project requirements into workable drawings and specifications to accomplish the project within the established scope and objectives. This encompasses both the preliminary design and final design for facility projects. It also includes providing cost estimates for the planned project at each design review stage.

A-41 **Design Review** -- a formal pause in the design contract where users and technical experts verify that the design adequately addresses the project scope, objectives, and technical requirements (typically at the 30-percent, 60-percent, and 90-percent design milestones).

A-42 **Discrete Facility Project** -- a CoF project with an estimated cost of $5 million or more.

A-43 **Drawings** -- graphic representations on either electronic media or paper that convey the intent of the project requirements.

A-44 **Emergency Repair** -- restoration of an existing facility or component(s) after a major breakdown or accident, as authorized by the NASA Space Act of 1958, as amended. HQ FERPD defines "emergency" as so urgent that it cannot wait to go through the normal budget cycle or process. For all emergency repairs, the replacement of components or materials will be of the size or character currently required to meet demands or needs.

A-45 **Environmental Analysis** -- the process of making the initial evaluation of the

environmental considerations of a proposed action including alternative proposals.

A-46 **Environmental Assessment (EA)** --one of three possible documents required for compliance with the National Environmental Policy Act (NEPA) process. The three documents in order of increasing effort and cost are a Categorical Exclusion (CATEX), an EA, and an Environmental Impact Statement (EIS). The EA is the correct path when the environmental impact is low, but does not qualify as a CATEX. For details, contact the Center Environmental Management Office.

A-47 **Environmental Impact Statement (EIS)** -- a document developed through the NEPA process when the impact to the environment is significant (e.g., a change in mission to a Center or the Agency with significant environmental ramifications--air/water quality, noise, soil contamination, or an increased risk [perceived or real] to the public). For details, contact the Center Environmental Management Office.

A-48 **Equipment/Property** -- Equipment within NASA is classified as either "personal property (other terms: noncollateral or accountable)" or "real property installed equipment (collateral)." Personal property is equipment whose maintenance, repair, and replacement are the responsibility of the NASA program owning it. All personal property equipment has attached property tags in the form of NASA bar codes. Real property installed equipment is equipment that is capitalized on the Real Property Inventory by the Center Real Property Accountability Officer.

A-49 **Facilities Maintenance** -- the recurring day-to-day work required to preserve facilities (buildings, structures, grounds, utility systems, and collateral equipment) in such condition that they can be used for their designated purpose over an intended service life. It includes the cost of labor, materials, and parts.

A-50 **Facility** -- land, buildings, structures, and other real property improvements including utility systems and collateral equipment. The term does not include operating materials, supplies, special tooling, special test equipment, or noncapitalized equipment (see Financial Management Manual (http://www.hq.nasa.gov/fmm/9200/9250.pdf) for criteria for capitalized equipment).

A-51 **Facility Acquisitions** -- the acquisition of an interest in land, buildings, other structures and facilities, or leasehold improvements. The normal facility acquisition methods include purchase, transfer, lease, easement, use permit, and rights of way.

A-52 **Facility Activation** -- the process of preparing or outfitting a facility for use when a Construction of Facilities project is substantially complete. This includes, but is not limited to, such activities as installation of noncollateral equipment, connection of noncollateral equipment to its interfaces, checkout of systems, and validation activities in support of operational readiness testing.

A-53 **Facility Need Date** -- the date when a facility is required for a specific purpose, such as to receive program hardware for test and checkout. First operational use of the

facility completes this milestone.

A-54 **Facility Outfitting** -- see "Outfitting."

A-55 **Facility Project** -- the consolidation of facility work items, including related collateral equipment, required to provide a complete and usable facility.

A-56 **Facility Project-Brief Project Document** (NASA Form 1509) -- a multipurpose document that must be used for all facility projects estimated to cost $100,000 or more, regardless of location or source of funding.

A-57 **Facility Project Cost Estimate** (NASA Form 1510) -- the form in which the approved facility project cost estimate (AFPCE) is further detailed beyond the summary in NASA Form 1509.

A-58 **Facility Project Manager** -- the individual responsible for organizing, managing, and directing the activities to accomplish facility work within schedule and cost. Different individuals may fill this role at different phases of a project.

A-59 **Failure Modes and Effects Analysis (FMEA)** -- a process used to determine which parts fail, why they usually fail, and what effect their failure has on the total system. This is an element within Reliability Centered Maintenance (RCM) (see Reliability Centered Maintenance Guide for Facilities and Collateral Equipment at http://www.hq.nasa.gov/office/codej/codejx/Assets/Docs/RCMGuide Mar2000.pdf).

A-60 **Federal Agency** -- a specific organization that the executive, legislative, or judicial branches of the U.S. Government has established.

A-61 **Fiscal Year** -- the 12-month period from October 1 through September 30 as established each year by the U.S. Government.

A-62 **Five-Year Plan** -- a list of projects by fiscal year that meet functional requirements needed to achieve a Center's assigned mission.

A-63 **Flash Bid Report** (NASA Form 1579) -- a form summarizing the results of a project bidding process.

A-64 **Fragmentation** -- the planning, development, or execution of two or more interdependent projects to circumvent the appropriate budget approval process.

A-65 **Full Disclosure Concept** -- for all stages of planning, approval, and management of a facility project, the Full Disclosure Concept requires that project documentation outline all reasonably identifiable elements of cost necessary to achieve a fully operable facility. The estimated cost of the facility project must include every associated element of real property including collateral equipment. It must also identify all other equipment required to the extent practicable (see Appendix D, Facility and Other Related Costs, for a listing of items and types to include).

A-66 **Fund** -- a sum of money authorized by law and set aside for use for specified

purposes.

A-67 **Funding** -- the issuance of funds to incur commitments and obligations and make payments within appropriations made by Congress.

A-68 **Government-Furnished Property** -- property owned by the Government and provided to a contractor for use in performance of a contract.

A-69 **Ground Support Equipment** -- nonflight equipment, implements, and devices required for handling, servicing, inspecting, testing, maintaining, aligning, adjusting, checking, repairing, and overhauling an operational end item or a subsystem or component thereof. This may include equipment required to support another item of ground support equipment as defined herein.

A-70 **Improvements** -- an addition to land, buildings, other structures, and attachments or annexations to land that is intended to remain so attached or annexed, such as sidewalks, drives, tunnels, utilities, and installed collateral equipment.

A-71 **Indirect Cost** -- a cost of labor and material not related to specific research and development projects.

A-72 **Invitation for Bids** -- the solicitation documents used to acquire a project requirement under sealed bidding rules in the FAR and NASA FAR Supplement.

A-73 **Land Acquisition** -- an acquisition of title to land including any interest therein, such as mineral and water rights, easements, rights of way, or interagency permits whether obtained by purchase or other means.

A-74 **Lease** -- an instrument conveying an interest in land, buildings, or other structures and facilities for a specified term and revocable as specified by the terms of the instrument, in consideration of payment of a rental fee.

A-75 **Life-Cycle Cost** -- an estimate of the economic impact over a selected design life of a project or project alternative. This estimate includes first cost, energy consumption, periodic replacement of equipment or materials, operations, and maintenance.

A-76 **Limitation** --a statutory or administratively imposed restriction within an appropriation or other authorization act that establishes the maximum threshold for a specific purpose.

A-77 **Long-Lead Items** -- items that, because of their complexity of design, complicated manufacturing processes, or limited production, require an extraordinary length of time for delivery.

A-78 **Maintainability** -- the design, installation, and operational characteristics of an item used for ease of keeping it operational, e.g., designed access to a chiller's coils for easy cleaning.

A-79 **Maintenance** -- see "Facilities Maintenance."

A-80 **Major Facility Work** -- see "Discrete Facility Project."

A-81 **Major Renovation** -- a repair project on an existing facility that exceeds 50 percent of the replacement value for the space in question.

A-82 **Modification** -- a project that was not originally budgeted for a specific fiscal year.

A-83 **Negotiation** -- the method of making purchases and contracts without using sealed bidding procedures.

A-84 **New Capability** -- a facility project that is needed to support new programmatic or institutional requirements. This includes projects for the rehabilitation/modernization and repair of existing facilities when the facility supports new programmatic or institutional requirements.

A-85 **Nonappropriated Funds** -- funds not associated with an appropriation, such as funds received through international cooperation, gifts, donations, and NASA exchanges.

A-86 **Noncollateral Equipment** -- equipment other than collateral equipment that, when acquired and used in a facility or a test apparatus, can be severed and removed after erection or installation without substantial loss of value or damage to the premises where installed.

A-87 **Notice to Proceed** -- the date of direction from the CO to a contractor authorizing commencement of work.

A-88 **Obligation** -- the award of a contract or purchase order by a CO to satisfy a contractual agreement.

A-89 **Operational Readiness Review** -- the final NASA review of a facility immediately prior to placement into its intended operation.

A-90 **Operations and Maintenance Manuals** -- organized procedural information specifying methods of operating and maintaining building systems, collateral equipment, and support equipment. O&M personnel use the manuals in the performance of day to day tasks. Preferably, the manuals are in an electronic format.

A-91 **Outfitting** -- the process of equipping a facility for its intended purpose during activation.

A-92 **Option** -- a unilateral right in a contract by which, for a specified time, the Government may elect to purchase additional supplies or services called for by the contract or may elect to extend the term of the contract.

A-93 **Partnering** -- a Government contractor relationship to foster the achievement of

mutually beneficial goals (see NFS, 48 CFR, Chapter 18, Part 1836 Subpart 1836.70 (http://www.hq.nasa.gov/office/procurement/regs/1836.doc).

A-94 **Past-Year** -- the fiscal year immediately prior to the current fiscal year.

A-95 **Payback** -- the amortization period defined in years calculated by dividing the total budget estimate by the total expected discounted annual savings.

A-96 **Predictive Testing & Inspection (PT&I)** -- the use of advanced technology to assess condition of equipment, utilities, and systems. When using RCM, the PT&I data obtained allows for planning and scheduling preventive maintenance or repairs prior to failure.

A-97 Procurement -- the purchase, rent, lease, or other acquisition of supplies, services, or facilities. It includes all functions that pertain to the acquisition of supplies and services including description, but not determination of requirements, selection, and solicitation of sources; preparation and award of contract; and all phases of contract administration.

A-98 **Program Offices** -- Headquarters organizational elements, such as the following:

a. Space Operations Mission Directorate (http://www.hq.nasa.gov/osf/).

b. Aeronautics Research Mission Directorate (http://www.aerospace.nasa.gov/).

c. Exploration Systems Mission Directorate (http://exploration.nasa.gov/).

d. Science Mission Directorate (http://science.hq.nasa.gov/).

A-99 **Progress Payment** -- a partial expenditure of funds made to a contractor as work progresses.

A-100 **Project** -- a specific investment having defined goals, objectives, requirements, life-cycle costs, a beginning, and an end. A project yields new or revised products or services that directly address NASA's strategic needs.

A-101 **Project Definition Rating Index (PDRI)** -- a Construction Industry Institute best practice tool used in front-end planning to determine how well a project is defined. This tool is used throughout project development, but is scored at the 30% design stage. The scoring system is based upon a 1000-point scale, and a low score (i.e. 200 or less) reflects a well-defined project.

A-102 **Project Scope** -- the description of a facility project limits, objectives, and planned result. The scope of a facility project typically includes a description of its location, purpose, capabilities, capacity, physical dimensions, configuration, and utilities affected.

A-103 **Project Team** -- the team responsible for organizing, managing, and directing

facility project work. It includes all project stakeholders, such as representatives from the using organization, safety, engineering, fire protection, security, environmental, acquisition, operations and maintenance, and technicians.

A-104 **Purchase Request/Purchase Order** -- a document or electronic file used to convey funds to the CO. It also describes the supplies or services required and a Government cost estimate for those supplies or services.

A-105 **Real Property** -- land, buildings, structures, utility systems, improvements, and appurtenances permanently annexed to land. The term real property also includes installed collateral equipment.

A-106 **Related Costs** -- estimated cost elements of project work that are not included in the facility project cost estimate (see Appendix D for more detailed information)

A-107 **Reliability Centered Building and Equipment Acceptance Guide** -- a technical reference (http://www.hq.nasa.gov/office/codej/codejx/Assets/Docs/RCB&EGuideJUL04.pdf) for design engineers, project and program managers, construction managers and inspectors, quality control personnel, and NASA quality assurance staff to use prior to and during the equipment startup/checkout phase of new construction, repair, or rehabilitation projects. It focuses on the use of Predictive Testing and Inspection (PT&I) technologies by the contractor to detect latent manufacturing and installation defects as a normal part of the contractor's quality control program.

A-108 **Reliability Centered Maintenance (RCM)** -- a process used to determine the most effective approach to maintenance. It involves identifying actions that, when taken, will reduce the probability of failure and are the most cost effective. It seeks the optimal mix of Condition-Based Actions, other Time- or Cycle-Based actions, and a Run-to-Failure approach (see Reliability Centered Maintenance Guide for Facilities and Collateral Equipment at http://www.hq.nasa.gov/office/codej/codejx/Assets/Docs/RCMGuide Mar2000.pdf and "Predictive Testing & Inspection").

A-109 **Renewal Rate (Yearly)** -- the Current Replacement Value (CRV) in dollars divided by the revitalization investment expressed in dollars per year.

A-110 **Renovate** -- see "Repair."

A-111 **Repair** --work required to restore a facility or component to its originally intended condition, capacity, efficiency, or capability.

A-112 **Replace** -- see "Repair."

A-113 **Resources** -- actual assets of a governmental unit, such as funds, human resources, and materials.

A-114 **Resources Authority Warrant** -- a document granting authority to initiate,

commit, obligate, and outlay funds for approved projects and activities.

A-115 **Revitalization** -- substantial renewal and upgrade work on the physical plant to meet current and future needs, thereby extending its useful life; e.g., a facility project that extends the useful service life beyond the original design life.

A-116 **Salvage** -- property that has some value in excess of its basic material content, but is in such condition that it has no reasonable prospect of use for any purpose as a unit, and its repair or rehabilitation for use as a unit is clearly impracticable.

A-117 **Site Activation Need Date** -- the date equipment/Ground Support Equipment is required to support installation and validation. Uncrating, inspecting, and handling time must be allowed for in establishing this date.

A-118 **Spare** -- an item peculiar to a system or end item held in reserve or backup.

A-119 **Specifications Kept Intact** -- the NASA standard construction specification system.

A-120 **Statutory Limitation** -- see "Limitation."

A-121 **Supervision, Inspection, and Engineering Services (SIES)** -- funding allowance used to provide the necessary controls and management during construction, and such deliverables as as built drawings and O&M manuals.

A-122 **Sustainability** -- An overarching concept incorporating appropriate sustainable design practices, maintainable design elements, building commissioning processes, safety, health and security features into facility planning, design, construction, activation, operation and maintenance, and decommissioning to enhance and balance facility life-cycle cost, environmental impact, and occupant health, safety, security, and productivity. Done properly, sustainability will optimize the facility acquisition process to ensure the "best fit" of the built environment to the natural environment. It requires a practical and balanced approach to responsible stewardship of natural, human, and financial resources.

A-123 **Sustainment** -- a parametric estimated cost to keep facilities in an acceptable condition. This is the lowest recommended funding level for facility maintenance.

A-124 **Validation** -- verification that the equipment/system meets the operational needs of the O&M user. It is part of the turnover process from the design agency to the O&M agency.

A-125 **Value Engineering** -- the systematic application of recognized techniques to determine the lowest practical overall cost of a facility consistent with the requirements of performance, reliability, and maintainability.

Appendix B. Abbreviations and Acronyms

ADA	Americans with Disabilities Act
A-E	Architect-Engineer
AFPCE	Approved Facility Project Cost Estimate
ARC	Ames Research Center
ASHRAE	American Society of Heating, Refrigeration, and Air-Conditioning Engineers
ASTM	American Society for Testing Materials
BCA	Building Commissioning Association
BIPV	Building-Integrated Photovoltaics
BMP	Best Management Practices
BTU	British Thermal Units
BY	Budget Year
CA	Commissioning Authority
CCB	Change Control Board
CCE	Current Cost Estimate
CFO	Chief Financial Officer
CFR	Code of Federal Regulations
CII	Construction Industry Institute
CMMS	Computerized Maintenance Management System

CO	Change Order or Contract Officer
CoF	Construction of Facilities
COSS	Center Operations Support Services
COTR	Contracting Officer's Technical Representative
CPG	Comprehensive Procurement Guidelines
CPM	Critical Path Method
CSI	Construction Specification Institute
DFRC	Dryden Flight Research Center
DoD	Department of Defense
DOE	Department of Energy
DSN	Deep Space Network
EA	Environmental Assessment
EE	Engineering Estimate
EEO	Equal Employment Opportunity
EIS	Environmental Impact Statement
EMCS	Energy Management Control Systems
EO	Executive Order
EPA	Environmental Protection Agency
FAR	Federal Acquisition Regulation
FEMP	Federal Energy Management Program
FERPD	Facilities Engineering and Real Property Division
FMEA	Failure Modes and Effects Analysis
FMM	Financial Management Manual
FMP	Facilities Master Plan
FMS	Facilities Management System
FONSI	Finding of No Significant Impact

FP&D	Facility Planning and Design
FPM	Facility Project Manager
FPN	Facility Project Number
FPT	Functional Performance Tests
FRB	Facilities Review Board
FSC	Federal Supply Catalog
FY	Fiscal Year
GBA	Green Building Advisor
GFP	Government-Furnished Property
GPE	Governmentwide Point of Entry
GRC	Glenn Research Center
GSA	General Services Administration
GSE	Ground Support Equipment
GSFC	Goddard Space Flight Center
HSF	Human Space Flight
HVAC	Heating, Ventilation, and Air-Conditioning
IAQ	Indoor Air Quality
IEQ	Indoor Environmental Quality
IESNA	Illuminating Engineering Society of North America
IFB	Invitation for Bid
IPO	Institutional Program Offices
ISC	Interagency Security Committee
IST	Integrated Systems Test
JPL	Jet Propulsion Laboratory
JSC	Johnson Space Center
KSC	Kennedy Space Center

LaRC	Langley Research Center
LEED	Leadership in Energy and Environmental Design
LLIS	Lessons Learned Information System
LS	Lump Sum
MAF	Michoud Assembly Facility
MS	Mission Support
MSFC	Marshall Space Flight Center
N/A	Not Applicable
NASA	National Aeronautics and Space Administration
NEHRP	National Earthquake Hazard Reduction Program
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NFS	NASA Far Supplement
NIBS	National Institute of Building Services
NIST	National Institute of Standards and Technology
NODIS	NASA Online Directives Information System
NPD	NASA Policy Directive
NPG	NASA Procedures and Guidelines
NRC	National Research Council
NSBF	National Scientific Balloon Facility
NSPE	National Society of Professional Engineers
NSS	NASA Safety Standard
NTP	Notice to Proceed
O&M	Operations and Maintenance
OMB	Office of Management and Budget
OPR	Owner's Project Requirements

OSHA	Occupational Safety and Health Administration
PBS	Plum Brook Station
PCSD	President's Council on Sustainable Development
PD	Program Direct
PDRI	Project Definition Rating Index
PER	Preliminary Engineering Report
PES	Preliminary Environmental Survey
PR	Procurement Request
PT&I	Predictive Testing & Inspection
QA	Quality Assurance
R&D	Research and Development
RCBEA	Reliability Centered Building and Equipment Acceptance
RCM	Reliability Centered Maintenance
RCRA	Resource Conservation and Recovery Act
REV	Review
RFP	Request for Proposal
RFQ	Request for Quote
ROD	Record of Decision
SBIC	Sustainable Buildings Industry Council
SF	Standard Form or Subcontractor-Furnished
SIES	Supervision, Inspection, and Engineering Services
SOW	Statement of Work
SPECSINTACT	Specifications-Kept-Intact
SPOC	Single Point-of-Contact
SS	Special Studies
SSA	Source Selection Authority

SSC	Stennis Space Center
SUB	Subcontractor
TAB	Testing, Adjusting, and Balance
TM	Technical Manual
UCS	Utilities Control System
UPN	Unique Project Number
USGBC	U.S. Green Building Council
VE	Value Engineering
WBDG	Whole Building Design Guide
WFF	Wallops Flight Facility
WSTF	White Sands Test Facility
YR	Year

Appendix C. Forms and Instructions

Reference	Title	Form Number/Name
C.1	Facility Project--Brief Project Document	NASA Form 1509
C.2	Facility Project Cost Estimate	NASA Form 1510
C.3	Flash Bid Report	NASA Form 1579
C.4	Long Form Writeup	Long Form Writeup
C.5	CoF Routine Transaction Form	CoF Routine Transaction
C.6	CoF Self Assessment Metrics	CoF Self Assessment Metrics

C.1 NASA Form 1509, Facility Project--Brief Project Document

National Aeronautics and Space Administration

Facility Project-Brief Project Document

PROJECT ID | PROJECT CODE

PROJECT TITLE | INSTALLATION/PROGRAM OFFICE | DATE | SUB/REV. NUMBER

APPROVED FACILITY PROJECT COST ESTIMATE

ITEMS (LIST)	AMOUNT
TOTAL ▶	

RELATED COST DATA
(Not included in the Approved Facility Project Cost Estimate, but required to make the facility initially operable)

RELATED COSTS INVOLVED ☐ YES (Identify) ☐ NONE | SS (Amount) | PER (Amount) | DESIGN (Amount)

OTHER RELATED EQUIPMENT

ITEM	AMOUNT	ITEM	AMOUNT
TO BE PURCHASED		FUTURE FUNDING	
		ACTIVATION	
TRANSFER OF EXCESS		OTHER REAL ESTATE	
EXISTING		OTHER (Specify)	

CATEGORY	JUSTIFICATION	WORK
FUND SOURCE	TYPE	IDENTIFICATION

SCOPE/DESCRIPTION

BASIS OF NEED

PDRI: of possible at % design

SCHEDULE DATES

	START	COMPL
PER		
DESIGN		
CONSTRUCTION		
ACTIVATION		
OPERATIONAL		

PROJECT APPROVAL

	SIGNATURE AND TITLE	DATE
SUBMITTED BY		
CONCURRENCE BY		
JX CONCURRENCE		
APPROVED BY		

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Figure C-1a NASA Form 1509, Facility Project--Brief Project Document

National Aeronautics and Space Administration — **Facility Project-Brief Project Document**

PROJECT TITLE		PROJECT ID	PROJECT CODE
	INSTALLATION/PROGRAM OFFICE	DATE	SUB/REV. NUMBER

APPROVED FACILITY PROJECT COST ESTIMATE

ITEMS (LIST)	AMOUNT
TOTAL ▶	

RELATED COST DATA
(Not included in the Approved Facility Project Cost Estimate, but required to make the facility initially operable)

RELATED COSTS INVOLVED ☐ YES (Identify) ☐ NONE | GS (Amount) | PER (Amount) | DESIGN (Amount)

OTHER RELATED EQUIPMENT

ITEM	AMOUNT	ITEM	AMOUNT
TO BE PURCHASED		FUTURE FUNDING	
		ACTIVATION	
TRANSFER OF EXCESS		OTHER REAL ESTATE	
EXISTING		OTHER (Specify)	

CATEGORY	JUSTIFICATION / WORK
FUND SOURCE	TYPE / IDENTIFICATION

SCOPE/DESCRIPTION

BASIS OF NEED

PDRI: of possible at % design

SCHEDULE DATES

	START	COMPL
PER		
DESIGN		
CONSTRUCTION		
ACTIVATION		
OPERATIONAL		

PROJECT APPROVAL

	SIGNATURE AND TITLE	DATE
SUBMITTED BY		
CONCURRENCE BY		
JX CONCURRENCE		
APPROVED BY		

NASA FORM 1509 APR 02 PREVIOUS EDITIONS ARE OBSOLETE.

C.1 NASA Form 1509 (Continuation), Facility Project-Brief Project Document

Figure C-1b NASA Form 1509, Facility Project--Brief Project Document (Continuation)

C.1 Instructions for NASA Form 1509, Facility Project -- Brief Project Document The bolded titles in the following paragraphs provide the cross references to the NASA Form 1509 shown in Figures C-1a and C-1b.

C.1.1 **Project ID** -- an identification number assigned by the submitting organization.

C.1.2 **Project Code** -- a Center-designated project number. Center CoF Managers determine the naming convention.

C.1.3 **Project Title** -- a short representative statement of the project that must include the type of work (e.g., repair) and the function of the proposed facility. The title should include the facility name(s) as used in approved master plans and assigned facility number(s); e.g., Construction of Solar Simulator Facility (110) and Rehabilitation of Lunar Simulator Facility (130). Discrete project titles must include the type of facility work and describe the primary objective of the project. Include the function(s) of the resultant facility in the title (e.g., Administration, Laboratory, Warehouse, Aircraft Hangar, or Test Cell).

C.1.4 **Installation/Program Office** -- indicate the appropriate field installation (i.e., Center or Component) and the Headquarters organization advocating the project (e.g., GRC/ARMD or MSFC/SOMD). If the project location is different from the appropriate field installation, the installation would be indicated as shown in the following examples:

a. "GRC/PB" for Plum Brook Station.

b. "MSFC/MAF" for Michoud Assembly Facility.

The Headquarters Office advocates include:

a. Aeronautics Research Mission Directorate (ARMD).

b. Exploration Systems Mission Directorate (ESMD).

c. Science Mission Directorate (SMD.

d. Space Operations Mission Directorate (SOMD).

C.1.5 **Date** -- indicate the date of preparation of the form.

C.1.6 **Sub/Rev Number** -- a submission/revision number that provides a record of the submissions of the Field Installations and approvals of Headquarters.

a. **Centers** -- indicate consecutively with capital letters. The initial submission is A. Subsequent revisions are B, C, and D.

b. **Headquarters** -- indicate consecutively with numbers. First approval is 0. Subsequent approvals are 1, 2, 3.... For example, the submission/revision number will be B/1 after the second submission of the project by the Field Installation and the second approval of the project by Headquarters.

C.1.7 **Approved Facility Project Cost Estimate** -- the cost estimate must fully disclose the cost of construction, including contractor services to execute the planned facility project and make it operational (excluding Related Cost Data described in C.1.12). The anticipated amounts for labor, materials, supplies, collateral equipment, land acquisition, and site development for planned work are included in the estimate. In certain instances, the planning for the execution of the facility project will include the use of engineering and construction management services provided by the contract. When applicable, the cost estimate will identify the cost for these contractual services as follows:

a. Engineering services for review and analysis of shop drawings.

b. Construction management services, including evaluation of work progress, preparation and maintenance of critical path method (CPM) network diagrams, resolution of problems due to unanticipated changes in scheduled work, and other similar services.

c. The cost for the accomplishment of specialized craftwork. When it is planned that NASA civil service employees will accomplish the work, identify and show as a separate element in the estimate.

The cost estimate may be a total for the entire project or broken down into specific segments or work packages.

The cost estimate also must provide a reasonable amount for contingencies, usually 10 percent. When establishing the amount for contingencies, consideration should be given to such factors as the nature and scope of work, material availability, interfaces or dependencies with other planned work or other items that could impact the work, and schedule. A modest contingency amount should suffice when the work is to construct a standard structure. An increased contingency amount should be considered when there is the potential for encountering significant unanticipated problems, such as modifying an existing space launch complex.

If a construction agent will manage the project, the estimated cost also must include the cost of that agent. The FPM must adjust the estimated cost of each project for the geographical area involved and for known or anticipated future cost conditions. The FPM must not include related costs within the AFPCE, but on the NASA Form 1509 under related costs (paragraph (9)).

Collateral Equipment encompasses building-type equipment, built-in equipment, and large, substantially

affixed equipment/property normally acquired and installed as part of a facility project. (See Appendix A, "Collateral Equipment").

The FPM will consider a unit of equipment substantially affixed if work described under either of the following items is required and the work estimate is $300,000 or more:

a. Providing any special foundations, utility services, or other facilities support for a unit of equipment and to actually install the unit.

b. Demounting the unit of equipment and performing any facility restoration work that might be involved in its removal from the NASA Form 1509, Facility Project--Brief Project Document, related building or structure.

When in doubt, the CoF Manager will request a determination on questionable (i.e., collateral or noncollateral) equipment from the Design and Construction Team of the Facilities Engineering and Real Property Division.

C.1.8 **Category**

C.1.8.1 **Justification** -- the categories for justification include the following:

a. **Cost Effective** -- work that is not program critical or institutional critical, but that, if accomplished, would result in demonstrable cost savings or other benefits over the expected life of the project (see Life-Cycle Cost Analysis as discussed in paragraph 2.2.4.12, Budget and Approval Documents).

b. **Emergency Repair** -- work that qualifies for funding from the CoF account under the provisions of Section 310 (b), National Aeronautics and Space Act of 1958, as amended.

c. **Energy Conservation** -- Direct Energy Projects that are principally justified to reduce energy consumption and costs, or Related Energy Projects that are justified for other purposes but do contribute to the reduction of energy consumption.

d. **Environmental** -- work required to correct an existing condition that might pollute the environment. It includes the correction of conditions to meet current environmental regulations. All environmental projects will indicate Environmental on this line item, as the projects are dictated by environmental regulatory requirements.

e. **Institutional Critical** -- work urgently required to correct an existing condition involving institutional facilities, such as accelerating deterioration, that requires prompt correction. It includes the improvement of utility systems that support major areas of the installation. The emphasis is on priority work that is not program related.

f. **Institutional Routine** -- work that is clearly necessary in the future but could be deferred to a subsequent budget year if necessitated by budget constraints.

g. **Life Critical** -- work required to correct conditions that are dangerous to the life and health of personnel, with the potential of fatal injuries if they are not corrected.

h. **Occupational Safety and Health** -- work required to meet current standards of the Occupational Safety and Health Act of 1970. Such work is necessary to improve the working environment for employees. This category is intended to accomplish work that is clearly needed for full compliance with the law and Executive Order (EO) 12196, Occupational Safety and Health Programs for Federal Employees, as amended.

i. **Program Critical** -- work that is urgently needed to support a specific R&D program or mission and has to be completed by a stated date for successful accomplishment of that program or mission.

j. **Program Support** -- work required to correct deficiencies in facilities that support R&D programs or missions. It includes deterioration that limits support of tests or operations and must be corrected in the current budget year. It also includes direct program projects that do not qualify as program critical projects.

k. **Safety** -- work required to correct a safety hazard or to provide adequate fire protection for personnel, high value equipment, materials, or records that are difficult or impossible to replace and that are needed in the performance of mission or other essential tasks.

l. **Security** -- work that is required to mitigate a security risk to the Center (personnel or property) identified through NPR 1620.2, Physical Security Vulnerability Risk Assessments.

m. **Health** -- work that is required to correct a health hazard or to provide adequate protection of personnel.

C.1.8.2 **Work** -- Categories for work reflect the type of work included in the project. The predominant type must be the first word in the block ("predominant" based upon associated cost). The following terms are acceptable work categories: repair, modification, construction, and land acquisition.

For minor facility projects, when more than one category of work is involved, the project is classified in accordance with the predominant work. If a project is 51 percent repair and 49 percent construction, it is a repair project.

C.1.9 **Fund Source**

C.1.9.1 **Type** -- the type of funds to be used for the facility project are indicated as Program Direct (PD) or CoF. The type of funds varies with the change in fiscal year according to the annual appropriations act approved by Congress and signed by the President. Contact the resources office for the correct input to this block for the fiscal year.

C.1.9.2 **Identification** -- the identification of funds varies with the change in fiscal year according to the annual appropriations act approved by Congress and signed by the President. Contact the resources office for the correct input to this block for the fiscal year.

C.1.10 **Related Cost Data** -- under the concept of full disclosure, all costs associated with a project execution must be shown. Since these costs are appropriated separately, they are not included in the approved facility project cost estimate (see Appendix D, Facility and Other Related Costs, paragraph D.2, Related Costs.).

C.1.10.1 **Related Costs Involved** -- check appropriate box. If "Yes," complete the following entries:

a. **Special Studies (SS) (Amount)** -- the cost to prepare special studies. Enter N/A if not required or not accomplished or "in house" if done by in house personnel.

b. **PER (Amount)** -- the cost to prepare a PER including reports, site surveys, and soil investigations. Enter N/A if not required or not accomplished or "in house" if done by in house personnel.

c. **Design (Amount)** -- the cost for the final design of the project. Enter N/A if not required or not accomplished or "in house" if done by in house personnel.

C.1.10.2 **Other Related Equipment** -- if equipment (other than collateral equipment--collateral equipment costs are included in the AFPCE), including office furniture, is required to make the facility initially operable, the following information is required:

a. **To Be Purchased** -- the total estimated cost for procurement, transportation, and installation of noncollateral equipment to be purchased under program appropriations.

b. **Transfer of Excess** -- the total book value of the excess equipment (collateral and noncollateral) to be transferred from another NASA Field Installation or Government agency. Estimated costs for transportation and installation of noncollateral equipment are included. For collateral equipment to be obtained by transfer of excess, however, the estimated out of pocket transportation, installation, and rehabilitation costs must be included in the approved facility project cost estimate.

c. **Existing** -- the estimated total value of equipment and real property improvements on hand at the Field Installation that can be utilized for the project.

d. **Future Funding** -- show the planned future funding for any subsequent related requirement.

e. **Activation** -- indicate the estimated costs associated with the installation of noncollateral (ground support) equipment, checkout, and initial operation of the facility that are funded as part of the operational costs (e.g., the installation of ground support equipment, the integration and checkout of combined facility and equipment systems, and the demonstration and acceptance of an operable facility). Enter "in house" if to be accomplished by in house personnel.

f. **Other Real Estate** -- indicate the estimated rental costs if applicable. The purchase of land, easements, and rights of way must be part of the facility project and is not included in this entry.

g. **Other (Specify)** -- other related costs not included above.

C.1.11. **Scope/Description** -- Describe the project's physical size, capacities, and characteristics. Quantify the extent of the project to the maximum extent possible (e.g., gross area, net usable area, capacity, health, fire and safety features, and special features). Attach a sketch, drawing, or site plan if it helps to describe the project. Provide a statement indicating completion of the environmental review process and the type of documentation prepared (i.e., Categorical Exclusion, Environmental Assessment, or an Environmental Impact Statement). Attach an explanation if the environmental process is not complete or normal documentation has not been prepared.

C.1.12 **Basis of Need** -- State the justification for the project and include the impact if the project is not accomplished. State the missions supported by this project and any known program schedule requirement that the project must meet. Identify any supporting engineering studies, economic evaluations, trade studies, or other considerations outlining the need for the project. For projects justified by Federal, State, or local regulations, cite the regulation.

The justification should be concise, complete, and factual. Whenever possible, it should specifically refer to related mission or program requirements and to the role of the proposed facility in the mission or program. Attach any known program milestones, schedules, flight schedules, or any other type of data that supports the justification. For projects replacing an existing capability, state the existing conditions and why they are unacceptable.

Support facilities, such as libraries, auditoriums, and cafeterias, must be justified separately and specifically. State any known specific project benefits. State known natural hazards, such as floods or earthquakes, that are unacceptable risks to mission. Briefly explain the unacceptable risks or cite the study that led to identification of the need for the requirement(s).

C.1.13. **PDRI** -- enter the projects' PDRI score, total possible score, and the percentage of design completion when the scoring occurred.

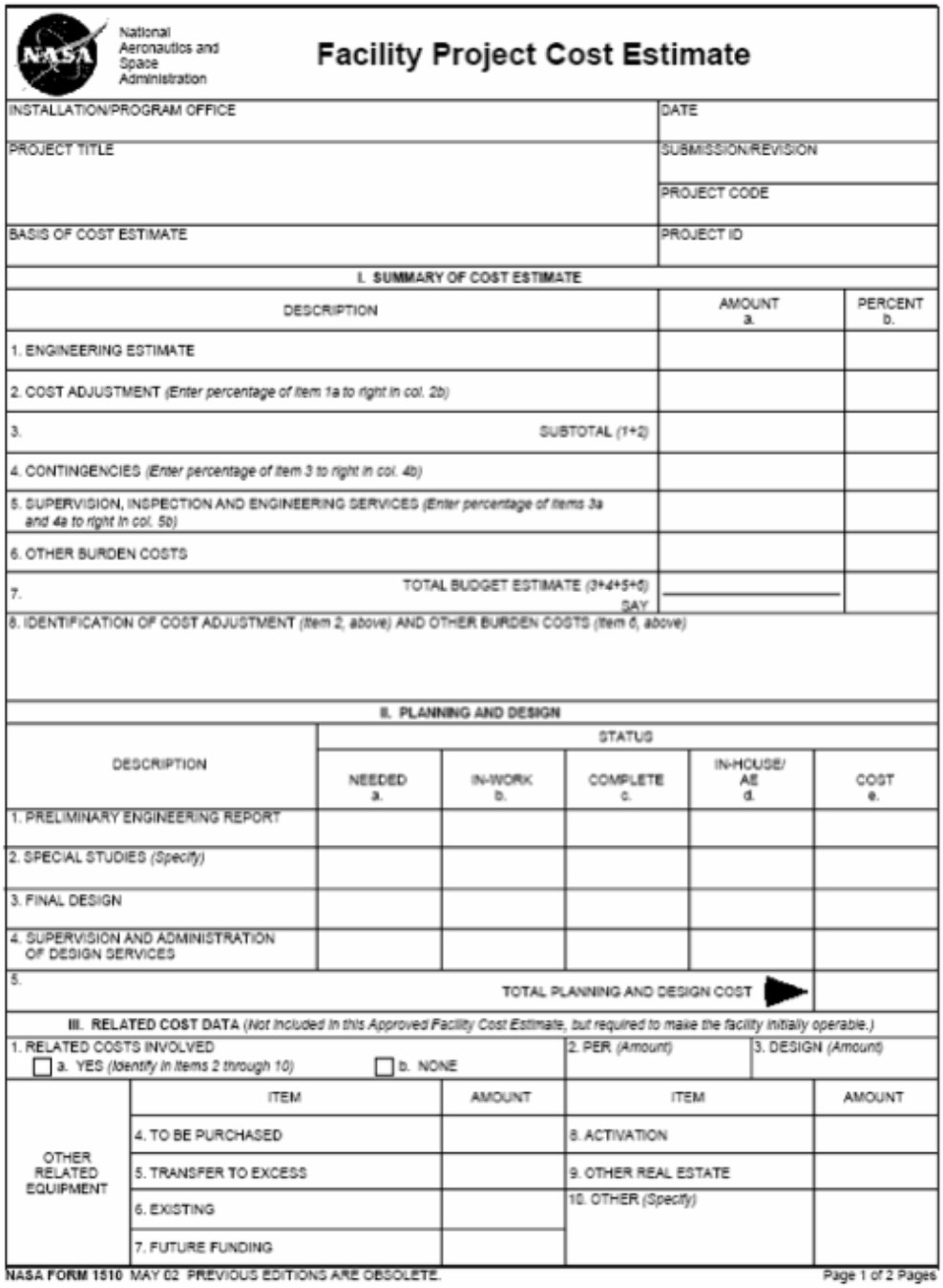
C.1.14. **Schedule Dates** -- indicate the schedule dates for PER, design, construction (execution), activation start, and the date the facility must be operational, if appropriate.

C.1.15. **Submitted** -- the signature and title of the Field Installation Director of the originating installation or designee is required on the project submitted to Headquarters for approval.

C.1.16. **Concurrence and Approval** -- to be completed at the Headquarters level for projects submitted for approval. These blocks also are available for locally approved projects.

C.1.17. **1509 Continuation Sheet** -- use for any additional supporting data required for the project beyond what is listed in Form 1509 (see Figure C.1-b).

C.2 NASA Form 1510, Facility Project Cost Estimate



National Aeronautics and Space Administration

Facility Project Cost Estimate

INSTALLATION/PROGRAM OFFICE	DATE
PROJECT TITLE	SUBMISSION/REVISION
	PROJECT CODE
BASIS OF COST ESTIMATE	PROJECT ID

I. SUMMARY OF COST ESTIMATE

DESCRIPTION	AMOUNT a.	PERCENT b.
1. ENGINEERING ESTIMATE		
2. COST ADJUSTMENT *(Enter percentage of item 1a to right in col. 2b)*		
3. SUBTOTAL *(1+2)*		
4. CONTINGENCIES *(Enter percentage of item 3 to right in col. 4b)*		
5. SUPERVISION, INSPECTION AND ENGINEERING SERVICES *(Enter percentage of items 3a and 4a to right in col. 5b)*		
6. OTHER BURDEN COSTS		
7. TOTAL BUDGET ESTIMATE *(3+4+5+6)* SAY		

8. IDENTIFICATION OF COST ADJUSTMENT *(Item 2, above)* AND OTHER BURDEN COSTS *(Item 6, above)*

II. PLANNING AND DESIGN

DESCRIPTION	STATUS				
	NEEDED a.	IN-WORK b.	COMPLETE c.	IN-HOUSE/ AE d.	COST e.
1. PRELIMINARY ENGINEERING REPORT					
2. SPECIAL STUDIES *(Specify)*					
3. FINAL DESIGN					
4. SUPERVISION AND ADMINISTRATION OF DESIGN SERVICES					
5. TOTAL PLANNING AND DESIGN COST					

III. RELATED COST DATA *(Not included in this Approved Facility Cost Estimate, but required to make the facility initially operable.)*

1. RELATED COSTS INVOLVED ☐ a. YES *(Identify in items 2 through 10)* ☐ b. NONE | 2. PER *(Amount)* | 3. DESIGN *(Amount)*

	ITEM	AMOUNT	ITEM	AMOUNT
OTHER RELATED EQUIPMENT	4. TO BE PURCHASED		8. ACTIVATION	
	5. TRANSFER TO EXCESS		9. OTHER REAL ESTATE	
	6. EXISTING		10. OTHER *(Specify)*	
	7. FUTURE FUNDING			

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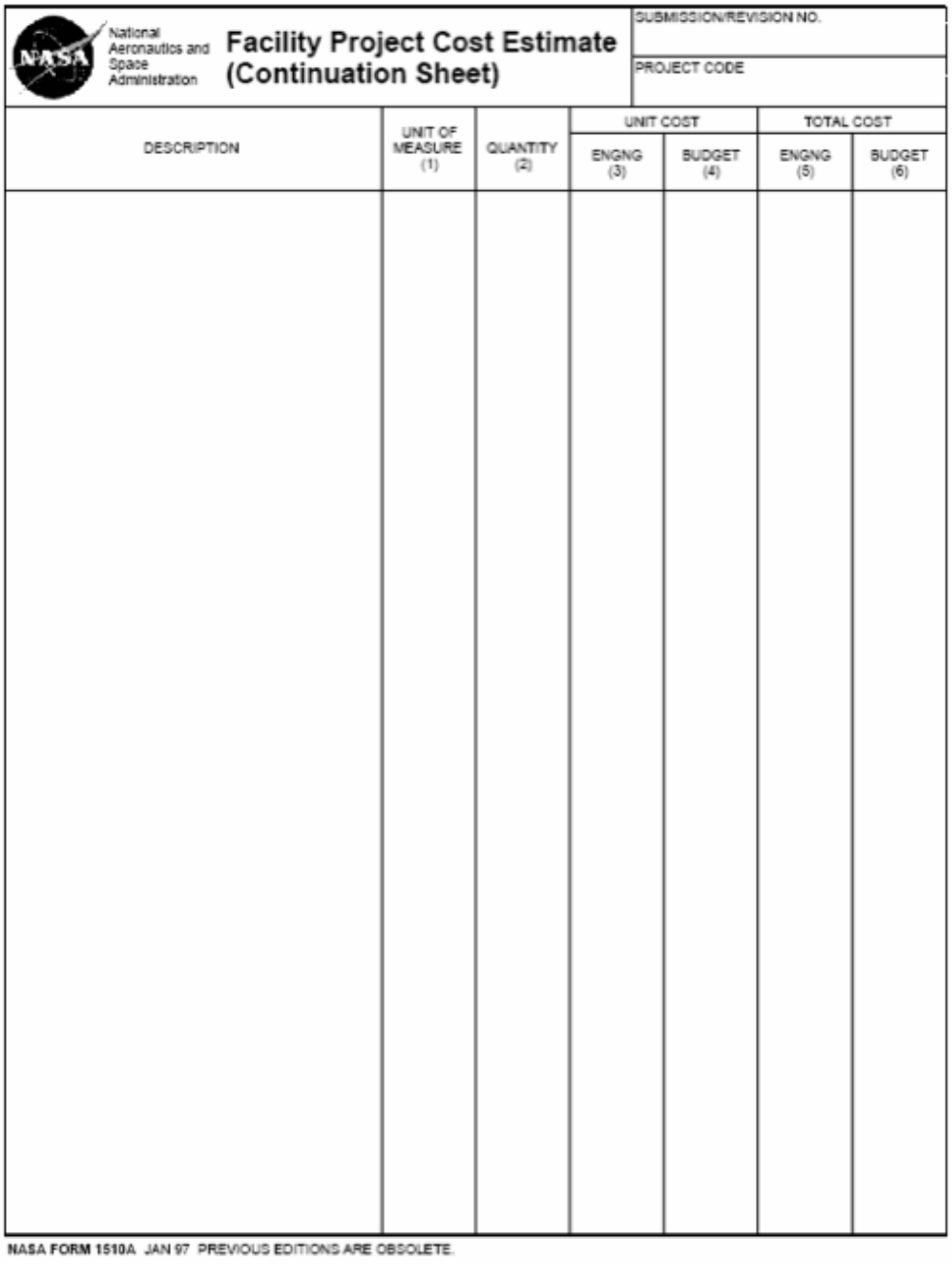
Figure C-2a NASA Form 1510, Facility Project Cost Estimate

C.2 NASA Form 1510 (Continuation) -- Facility Project Cost Estimate



National Aeronautics and Space Administration

Facility Project Cost Estimate (Continuation Sheet)

SUBMISSION/REVISION NO.

PROJECT CODE

DESCRIPTION	UNIT OF MEASURE (1)	QUANTITY (2)	UNIT COST		TOTAL COST	
			ENGNG (3)	BUDGET (4)	ENGNG (5)	BUDGET (6)

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Figure C-2b NASA Form 1510, Facility Project Cost Estimate (Continuation)

C.2 Instructions for NASA Form 1510, Facility Project Cost Estimate

The bolded titles in the following paragraphs provide the cross references to NASA Form 1510 shown in Figures C-2a and C-2b.

C.2.1 **Installation/Program Office, Project Title, Date, Submission/Revision Number, Project Code, Project ID** -- provide the same information as shown on NASA Form 1509.

C.2.2 **Basis of Cost Estimate** -- Indicate the basis of the cost estimate as follows:

a. Criteria and concepts only.

b. Preliminary engineering report.

c. Partially complete design (approved 30-percent, 60-percent, or 90-percent),

d. Completed final design.

e. Contractor's proposal.

f. Other (explain).

Also indicate the date and originator of the estimated costs (i.e., June 2006 in house estimate or June 2006 ABC Architect Engineer Company). To provide a uniform base for estimating costs for budget year estimates, the best available local or area experience as of the beginning of the past year should be used. In addition, the estimated local factor for increased costs should be applied to provide for cost increases (actual and anticipated) from the prior year base point and compounded annually to the project midpoint of construction. The basis of any such factor should be indicated (e.g., Engineering News-Record, March 2006). These costs will be reflected as a percentage added to the engineering estimate and will be included in the space provided under the Summary of Estimate.

C.2.3 I. **Summary of Estimate** -- the amount and percentage of the total estimated cost for the items listed below will be indicated in the appropriate entry blocks.

C.2.3.1 1. **Engineering Estimate (EE)** -- the total engineering cost estimate, which includes the costs for materials, labor, real estate actions, and services including contractor overhead and profit. Adequate design contingencies must be included. The EE will include all labor and material costs for all items including collateral equipment that would normally be furnished by a contractor and installed as permanent in the facility. When applicable, the cost to install GFP will be included. The EE does not include escalation, construction contingencies, or SIES. Estimates must identify funding requirements by fiscal year(s) and amount(s). The EE includes unit costs (i.e., units of measure and quantities for each significant item) instead of lump sum estimates.

C.2.3.2 2. **Cost Adjustment** -- the increase over the base cost used to cover anticipated cost increases compounded annually to the midpoint of the proposed construction period. Headquarters Facilities Engineering Division determines the percentage used. If higher rates for cost growth are needed to reflect local conditions, they must be supported by a special rationale establishing the uniqueness of the local conditions for the project.

C.2.3.3 3. **Subtotal (of Engineering Estimate + Cost Adjustment)** -- represents the project cost without contingencies, supervision, inspection, engineering services (SIES), or other burden costs.

C.2.3.4 4. **Contingencies** -- indicate normal construction contingencies estimated for changed conditions and essential change orders. Generally, it is 10 percent of the subtotal above.

C.2.3.5 5. **Supervision, Inspection, and Engineering Services (SIES)** -- the amount for the supervision and administration of the construction contract by a construction manager. Generally, it is 5 to 10 percent.

C.2.3.6 6. **Other Burden Costs** -- any other burden costs such as GFP refurbishment or transportation of equipment that might be included in the project.

C.2.3.7 7. **Total Budget Estimate** -- total estimated cost to provide an initially operable facility or total project as set forth in the scope and description of the facility project.

C.2.3.8 8. **Identification of Cost Adjustment** -- provide a description of the elements that constitute these factors.

C.2.4 II. **Planning and Design** -- provide data for the entries below:

C.2.4.1 1. **Preliminary Engineering Report (PER)** -- indicate the actual or estimated cost for the preparation of the PER for the project, normally 1-1/2 to 2 percent, its status, and method of accomplishment in the appropriate blocks.

C.2.4.2 2. **Special Studies** -- indicate the actual or estimated cost for any required special studies, normally two percent, that are not conceptual studies, such as soil borings or structural analyses. Describe the specific studies, their status, and method of accomplishment.

C.2.4.3 3. **Final Design** -- enter the actual or estimated cost for the preparation of final design, including contractual plans and specifications, and the status and method of accomplishment.

C.2.4.4 4. **Supervision and Administration of Design Services** -- the amount for supervision and administration of design by the construction agency.

C2.4.5 5. **Total Planning and Design Costs** -- the summary of the items in column e.

C.2.5 III. **Related Cost Data** -- provide a breakout and description of related cost data as specified in instructions for NASA Form 1509. See Appendix D, Facility and Other Related Costs, paragraph D.2 Related Costs for a partial listing of related cost items and type items to be included.

C.2.6 IV. **Facility Project Cost Estimate** -- The Field Installation must submit this information in considerable detail by each fiscal year for which funds have been provided or will be requested. See paragraph 3.5.3.1 for engineering estimate details and Appendix A, Definitions "Current Cost Estimate."

The unit of measure, quantity, unit cost, and total cost must be shown for each item that can be reasonably identified and quantified. The use of lump sum (LS) should be avoided as much as possible if meaningful quantities and unit costs can be applied. Any item estimated to cost more than 20 percent of the total project cost estimate shall be subdivided to show components and associated costs. The following are minimum breakdown items as applicable:

a. Interest in Real Estate -- if the project includes land acquisition or other interests in real estate, identify land and easement costs.

b. Site Development and Utilities Outside 5 Foot Line -- enter costs normally associated with developing the site, such as site clearance and demolition, earthwork and landscaping, storm and sanitary sewers, mechanical and electrical utilities, roads, bridges, marine facilities, and airfield pavements. Also identify construction costs associated with testing, excavation, removal, and treatment and disposal of hazardous contaminated soil, water, or groundwater.

c. Building/Structure Within 5-Foot Line -- includes construction costs for architectural/structural, mechanical, and electrical work; and, the associated collateral equipment. These items are listed in as many procurement packages as necessary to optimize procurement strategy and project control. The specific packaging should be compatible with the standard divisions of labor and contractual disciplines of the construction industry to avoid conflicts, overlaps, and other contractual complications. Each package should be numbered (e.g., First -- Addition to Building; Second -- Modification of Second Floor; Third -- Air Conditioning). Include in each package further breakouts of the following information:

1. Architectural/structural -- costs normally associated with foundations, structural framing, walls, roofing, finishes, and specialties.

2. Mechanical -- costs normally associated with mechanical building equipment, such as HVAC and plumbing, should be included. Built in, nonseverable mechanical equipment.

3. Electrical -- costs normally associated with electrical building equipment, such as transformers, motor starters and control centers, lighting fixtures, communications, distribution systems, and wiring, should be entered. Built-in nonseverable electrical equipment.

4. Fire protection/safety -- costs normally associated with fire protection/safety equipment and systems, such as sprinkler heads, detectors, alarms.

5. Environmental -- construction costs normally associated with testing, decontamination/ cleanup, and removal and disposal of hazardous contaminated materials within a building. This includes asbestos demolition work, such as testing; removal and disposal of the asbestos; building and material decontamination activities; and other such costs necessary in support of the facility project.

6. Other -- any other construction costs.

7. Collateral Equipment Not Included Above -- costs for collateral equipment not shown above.

8. Special Features -- include any significant special items, such as fallout shelters, flood control, medical facilities, environmental air controls, water/groundwater pollution control, special water/groundwater or sewage treatment, noise controls, and any secondary functions necessary to meet community needs or interfaces with other agencies or organizations.

C.2.6.1 **Source of Cost Data** -- identify source of the cost data (e.g., PER, contractor quotation, quantity take off, recent procurement history) in this block.

C.2.6.2 **Totals** -- Enter sum of the total costs for the Engineering and Budget columns of the form.

C.2.7 V. **Related Items/Actions** -- Explain related items (e.g., additional procurement, program activity, trade studies, or facility projects) that are not included under Part III -- Related Cost Data.

C.3 NASA Form 1579 Flash Bid Report

National Aeronautics and Space Administration

Flash Bid Report

Facility Project Contract Bid Opening and Award Data

PROJECT DATA			
1. PROJECT TITLE			
2. LOCATION	3. PROJECT NUMBER	4. DATE	
5. FISCAL YEAR	6. CATEGORY	7. AFPCE	

CURRENT COST ESTIMATE (CCE) Prior to Bid Opening	
8. ALL PRIOR BID PACKAGES	
9. THIS BID PACKAGE	
10. ALL REMAINING BID PACKAGES	
11. TOTAL CCE *(8 + 9 + 10)*	

THIS BID PACKAGE		
12. DESCRIPTION OF WORK		
13. GOVERNMENT BID ESTIMATE	14. BID OPENING DATE	15. NO. OF BIDS RECEIVED

16. BID INFORMATION

BID	CONTRACTOR, CITY, STATE	BASIC	ALT #1	ALT #2	ALT #3
LOW					
NEXT LOW					
HIGH					

17. ANTICIPATED AWARD AMOUNT	
18. REVISED CCE BASED ON LOW BID	
19. REVISED TOTAL CCE *(8 + 10 + 18)*	

20. AWARD DATE	20a. NOTICE-TO-PROCEED (NTP) DATE	20b. COMPLETION DATE
21. REMARKS		

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Figure C-3a NASA Form 1579, Flash Bid Report

C.3 Instructions for NASA Form 1579, Flash Bid Report

INSTRUCTIONS

PROJECT DATA

(1) Project Title - Use the same title as shown on the approved NASA FORM 1509 "Facility Project - Brief Project Document.

(2) Location - Indicate the cognizant Field Installation, Component Installation, or other location.

(3) Project Number - List the unique four-digit facility project number as shown in the IDENTIFICATION block of NASA FORM 1509.

(4) Date - Show the date of form preparation.

(5) Fiscal Year - Show the fiscal year as shown in the WORK block of NASA FORM 1509. If multi-year funding is involved, list each year.

(6) Category - Indicate the category as shown in the WORK block of NASA FORM 1509.

For CoF environmental projects, this line entry will identify the type of work to be performed (following the WORK entry block of NASA FORM 1509). Identify the environmental project category as follows:

a. Environmental CoF - Construction and Modification
b. Environmental CoF - Remediation
c. Environmental CoF - Projectized Study

(7) Approved Facility Project Cost Estimate (AFPCE) - Indicate the AFPCE as shown on NASA FORM 1509.

CURRENT COST ESTIMATE (CCE)
Prior to Bid Opening

(8) All Prior Bid Packages - List the CCE of all awarded contracts for this project.

(9) This Bid Package - Show the CCE from this bid package.

(10) All Remaining Bid Packages - Show the total CCE for all planned bid packages.

(11) Total CCE - Show the CCE based on the sum of items 8, 9, and 10.

THIS BID PACKAGE

(12) Description of Work - Describe the work included in this bid package.

(13) Government Bid Estimate - Include the engineering estimate developed by the Government or an A-E adjusted to the midpoint of construction. Does not include contingencies, SIES, or other burden cost.

(14) Bid Opening Date - Provide bid opening date.

(15) No. of Bids Received - Show the bid quantity received.

(16) Bid Information - Provide bidder related data.

(17) Anticipated Award Amount - Include base award and selected alternates.

(18) Revised CCE Based on Low Bid - Show CCE for this bid package (item 17 plus contingencies, SIES, and other burden cost).

(19) Revised Total CCE - Show the CCE based on the sum of items 8, 10, and 18.

(20) Dates - Provide the best estimate of the scheduled award, notice-to-proceed, and completion date.

(21) Remarks - Provide the relative narrative remarks as necessary.

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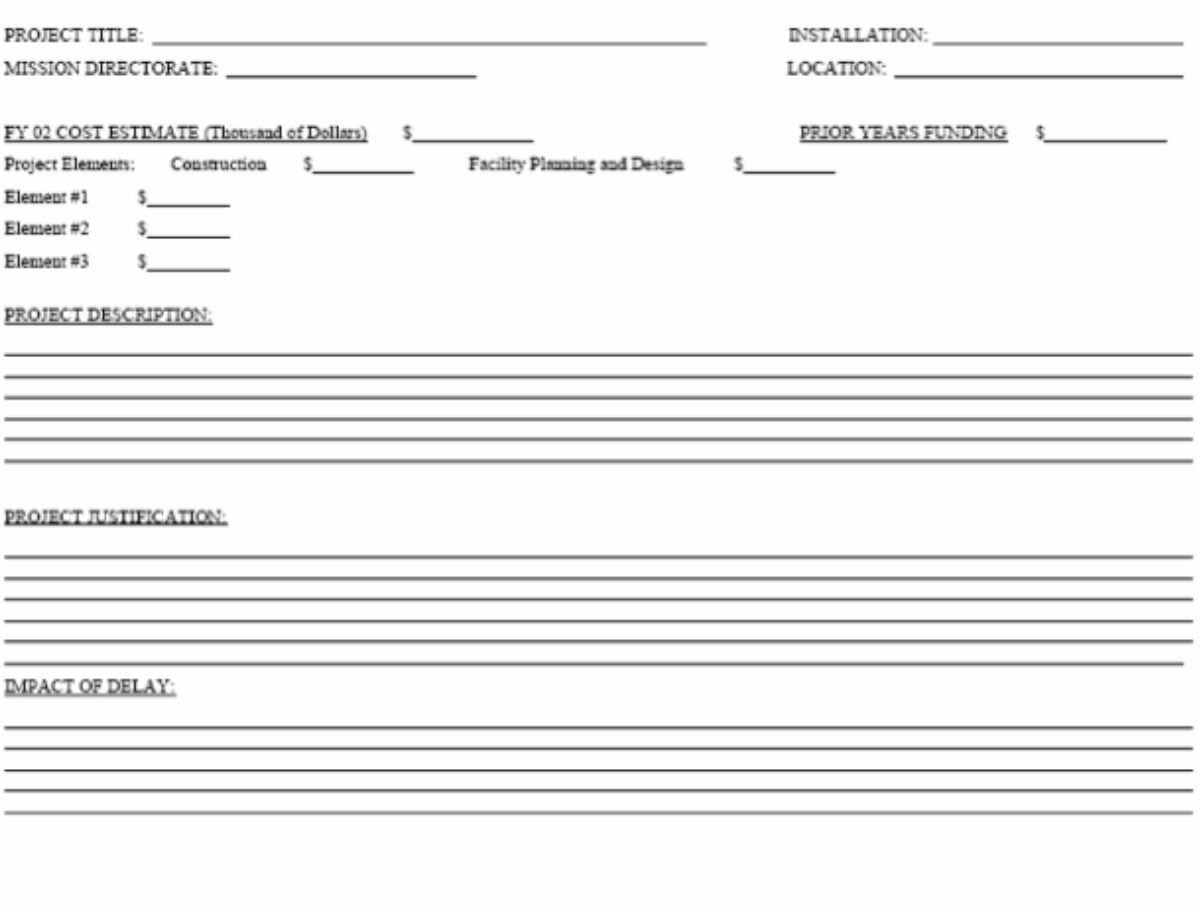
Figure C-3a NASA Form 1579, Flash Bid Report Instructions

C.4 Long Form Writeup


PROJECT TITLE: _____ INSTALLATION: _____

MISSION DIRECTORATE: _____ LOCATION: _____

FY 02 COST ESTIMATE (Thousand of Dollars) $_____ PRIOR YEARS FUNDING $_____

Project Elements: Construction $_____ Facility Planning and Design $_____

Element #1 $_____

Element #2 $_____

Element #3 $_____

PROJECT DESCRIPTION:

PROJECT JUSTIFICATION:

IMPACT OF DELAY:

Figure C-4 Long Form Writeup

C.4 Instructions for Long Form Writeup

The Long Form Writeup will be no longer than one page. It is used to describe discrete Construction of Facilities (CoF) projects in the Agency's budget submissions to the Office of Management and Budget (OMB) and the Congress.

C.4.1 **Project Title** --the same as the NASA Form 1509 project title.

C.4.2 **Installation** --the full name of the Center or Field Installation where the work is to be performed.

C.4.3 **Cognizant Office** --the responsible program office or other Headquarters office that advocates the project.

C.4.4 **Location** -- the place, city, county, state, or foreign country as appropriate. When the project includes work in separated locations, the phrase "Various Locations" is recommended.

C.4.5 **FY XX Cost Estimate (Thousand of Dollars)** --the major cost elements supporting the project as specified in paragraph 3.5.3, Section III: Engineering, Budget and Other Estimates.

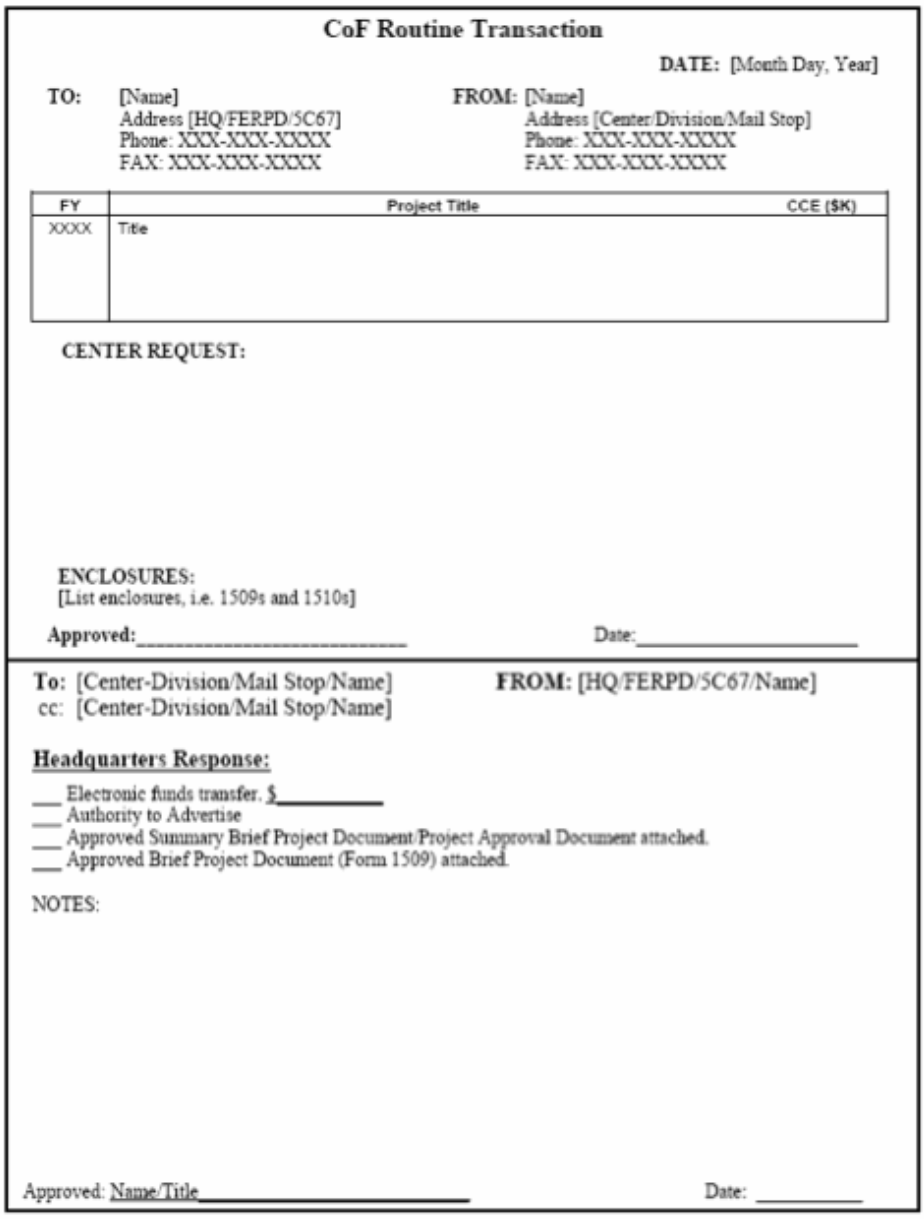
C.4.6 **Prior Years Funding** -- identify funds used or intended for use for planning, design, and construction of the project from prior years' programs.

C.4.7 **Project Description** -- will be the same or equivalent to that on the NASA Form 1509 for the project, but written as a budget narrative suitable for Presidential and Congressional review.

C.4.8 **Project Justification** -- will be the same or equivalent as the Basis of Need section of the NASA Form 1509 for the project, but written as a budget narrative suitable for Presidential and Congressional review. Exception, impacts to mission should be stated in the next section.

C.4.9 **Impact of Delay** -- provide impacts if the project is not implemented.

C.5 CoF Routine Transaction Form



CoF Routine Transaction

DATE: [Month Day, Year]

TO: [Name]
Address [HQ/FERPD/5C67]
Phone: XXX-XXX-XXXX
FAX: XXX-XXX-XXXX

FROM: [Name]
Address [Center/Division/Mail Stop]
Phone: XXX-XXX-XXXX
FAX: XXX-XXX-XXXX

FY	Project Title	CCE ($K)
XXXX	Title	

CENTER REQUEST:

ENCLOSURES:
[List enclosures, i.e. 1509s and 1510s]

Approved:_____ Date:_____

To: [Center-Division/Mail Stop/Name]
cc: [Center-Division/Mail Stop/Name]

FROM: [HQ/FERPD/5C67/Name]

Headquarters Response:

___ Electronic funds transfer. $_____
___ Authority to Advertise
___ Approved Summary Brief Project Document/Project Approval Document attached.
___ Approved Brief Project Document (Form 1509) attached.

NOTES:

Approved: Name/Title_____ Date: _____

Figure C-5 CoF Routine Transaction Form

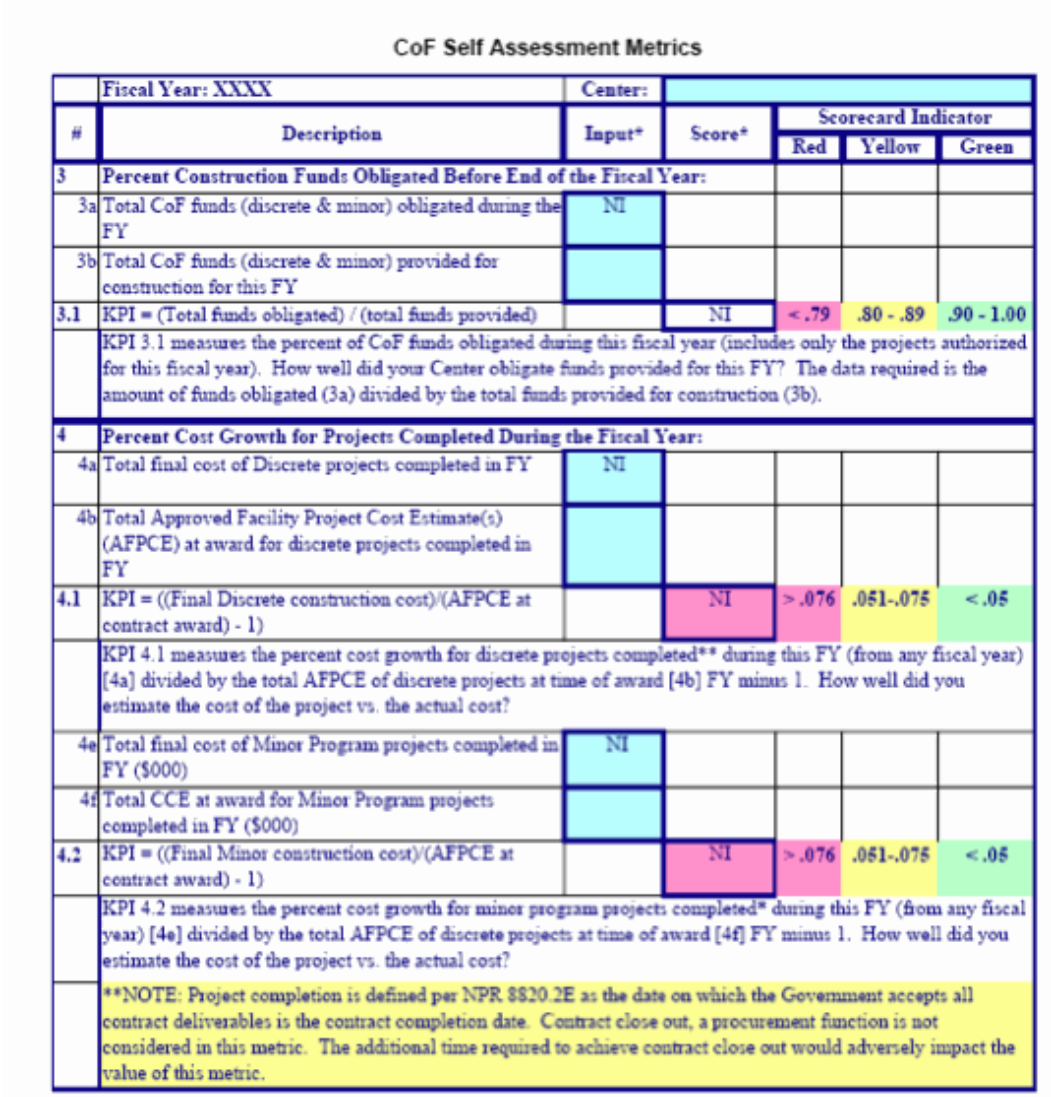
C.6 CoF Self Assessment Metrics -- Page 1

CoF Self Assessment Metrics

#	Description	Fiscal Year: XXXX / Input*	Center: / Score*	Scorecard Indicator Red	Yellow	Green
1	**Percent of Projects Designed Before Start of Fiscal Year**					
1a	Total Discrete Designs completed by the Beginning of the Fiscal Year (FY) of Construction (BOFYOC):	NI				
1b	Total Discrete Projects authorized for Design in FY:					
1.1	Key Performance Indicator (KPI) = Total Discrete Designs complete/total authorized		NI	<.79	.80 - .89	.90 - 1.00
1c	Total Minor Designs completed by BOFYOC:	NI				
1d	Total Minor Projects authorized for FY:					
1.2	KPI = (Total Minor Designs complete) / (total designs authorized)		NI	<.79	.80 - .89	.90 - 1.00
	* Notes: **Input** - if there is no data to input, type NA in the cell with "NI" in it. The **Score** is a calculated field, do not put data in this field.					
	KPI 1.1 & 1.2 measure the readiness for entering into the FY. Were the projects that were authorized for this FY ready for advertisement (i.e. 100% designed) by the beginning of this fiscal year? The data required for this calculation are the number of designs for the measurement period (fiscal year under review) ready for advertisement (1a and 1c, respectively) divided by the number of authorized projects (1b and 1d, respectively).					
2	**Percent Construction Contracts Awarded Before the End of the Fiscal Year**					
2a	Total Discrete Construction contracts awarded by the End of the Fiscal Year (EOFY):	NI				
2b	Total Discrete Projects Approved for Construction in FY:					
2.1	KPI = (Total Discrete Projects awarded) / (total projects approved)		NI	<.79	.80 - .89	.90 - 1.00
2c	Total Minor Construction contracts awarded by EOFY:	NI				
2d	Total Minor Projects Approved for Construction in FY:					
2.2	KPI = (Total Minor Projects awarded) / (total approved)		NI	<.79	.80 - .89	.90 - 1.00
	KPI 2.1 and 2.2 measure the percent of authorized projects awarded within the period fiscal year. How many projects planned for construction during this fiscal year were awarded (i.e., obligated) by the end of the fiscal year? The data required for the calculation is the number of projects awarded (2a and 2c) and the number of projects authorized (2b and 2d).					

Figure C-6 CoF Self Assessment Metrics

C.6 CoF Self Assessment Metrics (continued) -- Page 2



CoF Self Assessment Metrics

	Fiscal Year: XXXX	Center:				
#	Description	Input*	Score*	Scorecard Indicator		
				Red	Yellow	Green
3	**Percent Construction Funds Obligated Before End of the Fiscal Year:**					
3a	Total CoF funds (discrete & minor) obligated during the FY	NI				
3b	Total CoF funds (discrete & minor) provided for construction for this FY					
3.1	KPI = (Total funds obligated) / (total funds provided)		NI	< .79	.80 - .89	.90 - 1.00
	KPI 3.1 measures the percent of CoF funds obligated during this fiscal year (includes only the projects authorized for this fiscal year). How well did your Center obligate funds provided for this FY? The data required is the amount of funds obligated (3a) divided by the total funds provided for construction (3b).					
4	**Percent Cost Growth for Projects Completed During the Fiscal Year:**					
4a	Total final cost of Discrete projects completed in FY	NI				
4b	Total Approved Facility Project Cost Estimate(s) (AFPCE) at award for discrete projects completed in FY					
4.1	KPI = ((Final Discrete construction cost)/(AFPCE at contract award) - 1)		NI	> .076	.051-.075	< .05
	KPI 4.1 measures the percent cost growth for discrete projects completed** during this FY (from any fiscal year) [4a] divided by the total AFPCE of discrete projects at time of award [4b] FY minus 1. How well did you estimate the cost of the project vs. the actual cost?					
4e	Total final cost of Minor Program projects completed in FY ($000)	NI				
4f	Total CCE at award for Minor Program projects completed in FY ($000)					
4.2	KPI = ((Final Minor construction cost)/(AFPCE at contract award) - 1)		NI	> .076	.051-.075	< .05
	KPI 4.2 measures the percent cost growth for minor program projects completed* during this FY (from any fiscal year) [4e] divided by the total AFPCE of discrete projects at time of award [4f] FY minus 1. How well did you estimate the cost of the project vs. the actual cost?					
	**NOTE: Project completion is defined per NPR 8820.2E as the date on which the Government accepts all contract deliverables is the contract completion date. Contract close out, a procurement function is not considered in this metric. The additional time required to achieve contract close out would adversely impact the value of this metric.					

C.6 CoF Self Assessment Metrics (continued) -- Page 3

CoF Self Assessment Metrics

	Fiscal Year: XXXX	Center:				
#	Description	Input*	Score*	Scorecard Indicator		
				Red	Yellow	Green
5	**Percent Schedule Growth for Projects Completed During the Fiscal Year:**					
5a	Actual Discrete project contract duration days for all projects completed** during this FY	NI				
5b	Estimated discrete project planned days on original on approved Form 1509 (at the time of initial award)					
5.1	KPI = ((Actual contract duration days)/(Original estimated days (on 1509)) duration) - 1)		NI	> .20	.16 - .20	< .15
	KPI 5.1 measures the percent schedule growth for discrete projects completed** during this FY. It is calculated by dividing the total actual number of construction contract days [5a] by the total estimated construction contract days [5b] minus 1. How well did we estimate the project schedule?					
5c	Actual Minor Program project contract duration days for all projects completed** during this FY	NI				
5b	Estimated Minor Program project planned days on original on approved Form 1509 (at the time of initial award)					
5.2	KPI = ((Actual contract duration days)/(Original estimated days (on 1509)) duration) - 1)		NI	> .20	.16 - .20	< .15
	KPI 5.2 measures the percent schedule growth for minor projects completed** during this FY. divided by the total estimated duration in days minus 1					
6	**Safety Metrics for Construction Projects During the Fiscal Year:**					
6.1	KPI = RIR: Reportable Incident Rate during FY for construction contracts	NI	NI	> 8.0	> 2 ≤ 8.0	≤ 2.0
	KPI 6.1 data is for all active construction projects during the rating period FY (regardless of project FY)					
	RIR = (Total annual # of injuries incurred by sample firms x 200,000) / (Total annual # of hours worked by sample firms' employees)					
6.2	KPI = DART: Days Away, Restricted, or Transferred rate during FY for construction contracts	NI	NI	> 3.0	> 1 ≤ 3.0	≤ 1.0
	KPI 6.2 data is for all active construction projects (regardless of the project FY) during the rating period FY at your Center.					
	DART: This includes cases involving days away from work, restricted work activity, and transfers to another job and is calculated based on (N/EH) x (200,000) where N is the number of cases involving days away and/or job transfer or restriction, EH is the total number of hours worked by all employees during the calendar year, and 200,000 is the base for 100 full-time equivalent employees.					

C.6 CoF Self Assessment Metrics (continued) -- Page 4

CoF Self Assessment Metrics

#	Description	Fiscal Year: XXXX / Input*	Center: / Score*	Scorecard Indicator Red	Yellow	Green
7	**Percent of Mission Essential Security Projects Awarded During the Fiscal Year:**					
7a	Number of Mission Essential Security (MES) projects executed for this FY	NI				
7b	Number of Mission Essential Security projects planned for this FY					
7.1	KPI = (MES executed/MES planned)		NI	<.9	.9 - .95	> 95
	Note: A Mission Essential Security project is defined as security work on a Mission Essential Infrastructure real property asset or a project with a justification for the project is based upon a security requirement. (CoF projects only, do not include "locally approved" projects.)					
8	**Sustainability - Percent of Projects Registered for LEED During the Fiscal Year**					
8a	Total number of eligible construction projects registered for LEED certification	NI				
8b	Total number of eligible construction projects authorized for design in this FY year					
8.1	KPI = (# LEED Registered)/(Total # Projects eligible)		NI	< .35	.35 - .49	> .50
	KPI measures the percent of registered projects for LEED. It is calculated by dividing the total number of registered projects by the total number of projects that are LEED eligible*** (projects with LEED certification granted waiver by FERPD are not included)					
	***NOTE: "Eligible" projects are either a major renovation project (i.e., the cost of the project exceeds 50% of the replacement cost for that type construction) or a new construction project. Projects that construct additions to a building are "eligible."					
	LEED = Leadership in Energy and Environmental Design certification by the US Green Bldg. Council					

C.6 CoF Self Assessment Metrics (continued) -- Page 5

CoF Self Assessment Metrics

#	Description	Fiscal Year: XXXX / Input*	Center: / Score*	Scorecard Indicator Red	Yellow	Green
9	**Quality Ratings for Projects Completed During the Fiscal Year:**					
9a	Sum of quality survey scores addressing Mission Requirements	NI				
9b	Number of quality survey elements scored addressing Mission Requirements					
9.1	KPI = (sum of scores) / (total number of elements receiving a score)		NI	<2.5	2.5 - 4	> 4
	Survey questions: A 3 and 6; B 1, 4, 7, and 8.					
9c	Sum of quality survey scores addressing construction	NI				
9d	Number of quality survey elements scored addressing construction					
9.2	KPI = (sum of scores) / (total number of elements receiving a score)		NI	<2.5	2.5 - 4	> 4
	9.2 - average quality scores from quality survey					
9e	Sum of quality survey scores addressing mission schedule	NI				
9f	Number of quality survey elements scored addressing mission schedule					
9.3	KPI = (sum of scores) / (total number of elements receiving a score)		NI	<2.5	2.5 - 4	> 4
	9.3 - average quality scores from quality survey					
9g	Sum of quality survey scores addressing budget.	NI				
9h	Number of quality survey elements scored addressing budget.					
9.4	KPI = (sum of scores) / (total number of elements receiving a score)		NI	<2.5	2.5 - 4	> 4
	9.4 - average quality scores from quality survey					

Appendix D. Facility and Other Related Costs

D.1 Typical Facility Cost. The Current Cost Estimate (CCE) included on Forms 1510 and 1509 for a typical facility project includes the current local cost of the following:

a. Land acquisition.

b. Site preparation, utilities, sidewalks, and access roads.

c. Construction materials and labor.

d. Material and equipment tests performed at the construction site or at an offsite location.

e. Construction management services including network diagrams.

f. Environmental protection.

g. Collateral equipment.

h. Subcontractor and general contractor cost, overhead, and profit.

i. General conditions, bonds, and taxes.

D.2 Related Costs. The following is a partial list of items that are normally funded from funding accounts other than CoF. The Director, Facilities Engineering and Real Property Division, can approve exceptions.

a. Planning/studies documentation, such as the following:

1. Environmental Assessments (EA) and Environmental Impact Statements (EIS).

2. Permit actions (e.g., environmental, stormwater, dredging) unless directly related to the construction contracting effort.

3. Pre-PER studies (i.e., concept studies and/or requirements document).

b. Design-related activities other than SIES, such as the following:

1. Independent design analysis.

2. Third-party review.

3. Health and Safety analysis.

4. Engineering support.

5. Reliability and quality assurance support.

6. Software quality assurance support.

7. Program scheduling.

8. Documentation and control.

c. Outfitting items, such as the following:

1. Research, checkout, and assembly hardware/equipment.

2. Test support and ground support equipment.

3. Cleaning equipment.

4. Furniture.

5. Telephones, modems, switching equipment, and associated wiring (see Note 1).

6. Communications equipment (voice/data) and associated wiring (see Note 1).

7. Electronic security systems hardware (see Note 1).

8. Paging and area warning systems hardware (see Note 1).

9. Process/support equipment (see Note 1).

10. Replacing carpet and installation (initial carpet or carpet tile installation when used as the primary floor covering can be included in the CCE).

11. Window and door treatments (e.g., blinds, glare controls, and drapes, except where blinds are an integral part of the window or door unit and, thus, the initial purchase can be included in the CCE).

12. Lockers, unless built in.

13. Clocks.

14. Video equipment.

15. Computer hardware.

16. Automatic data processing equipment (including cables, fiber optics, and network connections).

d. Services, such as the following:

1. Building/vehicle maintenance.

2. Janitorial services.

3. Storage costs for noncollateral equipment.

4. Security personnel.

5. Spare parts.

6. Warranties (except when associated with equipment or structural members that are an integral part of the facility).

7. Operator certification and training programs.

8. Operational readiness reviews.

9. Integrated systems testing, health, and safety reviews.

e. Other expenses, such as the following:

1. Relocation/move-in expenses.

2. Acquisition process.

3. Personal and other health and safety protection.

4. Temporary housing.

5. Utility consumption.

6. Facility calibration.

7. Facility dedication.

8. Personnel travel.

9. Training (except for collateral equipment).

Note 1: In general, items that are permanently affixed, such as conduits, raceways, cable trays, ductwork, wall penetrations, terminal rooms, and junction and terminal boxes, are included in the CCE of the facility project.